SUPPORT DOCUMENT

Finding the common ground: Is there a place for sustainability education in VET?: Support document

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Contents

1 Global Context

1.1 Background

The publication of The Tragedy of the Commons (Harden, 1968) and Silent Spring (Carson, 1962) galvanized the green movement and parts of the scientific community to think very much more about the inherent connectivity between organisms and processes and through parable reminded us that humans live in a world where there are inherent limits to growth. This was possibly a watershed in human thinking propelling us from observing and exploring species diversity to beginning to embrace the concept of biodiversity; that is that species link together in complex pathways and systems that underwrite life itself and all that this entails. The Club of Rome built on this understanding with it publication Limits to Growth (Meadows et al 1972), and whilst being overly pessimistic and producing models based on flawed understanding, assumptions and input data, nevertheless offered a major correction to economic models offering humanity a nirvana of wealth based on never ending consumption and growth, albeit often at the expense of less wealthy countries. James Lovelock's Gaia (1979) theory, that the earth is a complex organism with processes continually adjusting through complex feedback processes also entered the psyche of 20th Century humans.

We are living now very much in a world of exponential deleterious changes. World population continues to grow exponentially, although there are now signs that growth is slowing down. Concurrently and directly linked to population growth, is the exponential loss of naturalness, unparalleled rates of species loss actual and predicted, exponential increases in land degradation almost wholly due to inappropriate agricultural practices, and shortages of key resources beginning to appear such as water and oil. Furthermore there are signs that many of our 'natural' and agricultural systems have been seriously impaired, with the crossing of ecological thresholds, requiring expensive and resource demanding restoration strategies rather than relying on natural regenerative processes. Cultural landscapes built up over millennia of human presence, very much ecosystems in their own right, are also being adversely impacted due to population pressures and perceived needs to intensify agricultural production. The oceans have not escaped the pressures of development and there is genuine concern that many of our fisheries have been over exploited.

A more insidious set of exponential changes is the increase of thousands of pollutants that are caught up in critical system cycles (water and carbon in particular) that can and do contaminate our food chains and impact on personal health. Many naturally produced substances such as greenhouse gases have led to accelerating global warming with the likelihood of adverse impacts on our weather, oceanic heat transfer cycles and sea levels.

In the last 200 years worldwide, we have created human-dominated cultural landscapes of a different ilk than in any previous human era. People flock to cities disconnecting themselves from nature and their obvious links with food chains and water catchments. Cities, whilst often offering cultural gains, can be sinks for dysfunctional living; not to mention their very significant ecological footprints and their penchant for being associated with assorted pollutants and major heat sinks.

Humans from diverse nations, cultures and religions have been reflecting and struggling with concepts of conservation and sustainability for nearly two centuries firstly in response to nature as wonder and mystery, then to concern about the global loss of species and latterly with the notion of sustainability of the human species itself as we face seemingly intractable problems.

This reflection is seen within indigenous cultures, the writings of the great 19th and 20th Century natural history mystics, the rise of the global conservation and environmental education movements, the study of natural history giving way to understanding the role of species in terms of ecosystem processes and communities of plants and animals underwriting the very nature of our most fundamental economic activities. The very heart of human values has been vigorously re-appraised in the last half century by almost every major religion and philosophical worldview examining their creation myths and/or historical roots in a re-evaluation of the whole of creation, with humans as but one small component, very dependent on the health of the whole. A defining moment in human history may well have been in our initial space explorations as we 'saw' for the first time from an outsiders' perspective, the rather frail earth spaceship in a new cosmic light. Initially 're-evaluation' appears to have led to a polarisation of societies with greens on the left and developers to the right and every conceivable shade of green and pink in between. Conflict, both local and global, formed part of the milieu in the reflecting process with industry and global players in open cultural war-fare with greens and their various political allies. Increasingly however, industry is beginning to drive development in ways that bring 'green' and 'brown' together, not just out of self-interest. The agricultural sector is desperately seeking ways to better integrate nature conservation and production agriculture to the point that exporting nations are already having to 'lift their game' in order to gain access to 'greening' markets demanding ISO accreditation.

1.2 Beyond science, technology and economics

In the 1970s an avalanche of activity took place in tertiary education across the world heralding environmental control and environmental science courses designed specifically to address the problems of the moment. The enveloping environmental crisis, seen more in terms of loss of naturalness and species as well as the increase in industrial pollutants, were primarily problems that science and technology could address if only the white coats could be given their head. This went hand in hand with education, extension and interpretation programs that were based on technology transfer and a 'jug and mug' pedagogy. That is, there were experts mainly in government and NGOs who viewed their calling as 'pouring' their collective wisdom into a receptive audience who would then apply this recipe approach in their community setting. The 'Control' or 'Techno centric' paradigm is based on a view of knowledge that is scientific and that gives primacy to scientific, objective and value-free concepts of reality. As a result, when it is applied to situations, which are shaped by human needs and preferences, it attempts to formulate solutions according to a reductionist cause and effect approach (Goldney *et al*,1995). This narrowly focused perspective has proven to be very ineffective in dealing with the systematic and humanistic complexities of situations involving integrated resource management. Nevertheless this philosophy still prevails in every strata of education in various guises.

At policy, planning and institutional level, this has led to the development of expert cultures which downgrade the value and effectiveness of non-scientific knowledge, community experience and wisdom. Resulting bureaucracies embody a hierarchic control mechanism approach to organization, which is strong on efficiency, but weak in terms of responsiveness to clients and flexibility in a changing environment. Thus decisions are made 'for the rest of society' by a small elite, screened from the wider input by the attitudes and processes just described (Goldney *et al*,1995).

To some extent the environmental education movement of the 1970s, based on a different pedagogical philosophy, inquiry science, avoided the pitfalls of the reductionist approach but made very little difference to environmental outcomes compared to the more emotive and substantive appeal of a well-honed green global movement.

The role of economists in this process was more-or-less business as usual addicted to a growth paradigm that ignored the realities of carrying capacity, ecological thresholds, externalities and

resource limitations in contrast to the economics of resource switching in the face of resource shortages. There were a few economists who were experimenting with sustainable economic models. Fortunately this situation is now changing for the better (Robinson and Tinker, 1998).

Always present but arising out of the spectacular failures of 'techno centric' education programs, the 'empowerment' paradigm has been variously labelled as 'participatory', 'human development approaches', community development' and 'enabling contexts' (Goldney *et al*,1997). The key elements of the 'empowerment' paradigm include a reformulation of the role of science and the relative contributions of rational and other sources of knowledge. There is therefore an emphasis upon 'process' (human perspective and decision-making contexts) as well as 'content' (technical issues). This approach regards the equal participation of 'expert' and 'lay' person as essential to any inquiry, planning and management process. Such approaches focus on the key factors of profitability, productivity and sustainability as the driving forces behind adoption behaviour.

2 What is Education for Sustainable Development?

2.1 Introduction

The notion of sustainable development became popularised by the 1987 report by the World Commission on Environment and Development, Our Common Future (Brundtland, 1987), which advocated the importance of achieving balance between economic, social, environmental and political needs. The task is not easy, embracing the concept of sustainable development requires a shift from the traditional understanding of development, which engenders economic and social outcomes, towards environmentally sustainable outcomes. A key strategy in the implementation of sustainable development is education of individuals, communities, businesses and government to increase awareness of sustainability.

2.2 Sustainable development

The concept of sustainable development and what the term means is widely contested. The most widely accepted and used definition is that of the World Commission on Environment and Development: "*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*" (Brundtland, 1987). The concept encourages a stable relationship between human activity and the natural environment so that economic, social and environmental needs are met.

Fien (2001) further elaborated on this definition and proposed four interdependent systems which comprised the pillars of sustainability. These included:

- ✧ biophysical systems, the life support systems for all human and non human life;
- ✧ economic systems, the continuing means of livelihood (income and employment);
- ✧ social and cultural systems, allowing people to live together peacefully, equitably and with respect for human rights and dignity; and
- ✧ political systems, the fair and democratic allocation of power to make decisions about the way social and economic systems use the biophysical environment.

(Fien, 2001, p.4)

Australia's commitment to sustainable development is defined in the Department of the Environment and Heritage document, Intergovernmental Agreement on the Environment (Commonwealth Government, 1992). The agreement facilitates a national approach to the environment, coordinating the state and federal government approach to:

> "using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased." (Commonwealth Government, 1992)

Further, the National Strategy for Ecologically Sustainable Development outlines the broad strategic directions and a framework for sustainable development to be directly incorporated into policy and decision-making. The implementation of sustainable development has also been identified as a key issue on the international front as outlined in Agenda 21, an international plan developed by the United Nations which identifies local, national and international actions that aim to improve the economic, social and environmental wellbeing of all nations.

Despite the recognised need for sustainable development, the concept is not widely understood and this leads to, in practice, the misuse and manipulation of the term. Policy in particular has focused on a much narrower definition of sustainability and has generally only explored balance in terms of economic social outcomes. Vocational Education and Training (VET) is one such example, where the Australian National Training Authority (ANTA) focuses on building the economic and social capacity of communities with no regard to the biophysical constraints. This selective perception can no longer continue as environmental constraints are increasingly challenging the future of economic capacity.

2.3 The role of education in sustainable development

The role of education in sustainable development is increasingly becoming recognised. Agenda 21 signified education, public awareness and training as key means of encouraging sustainable development.

> "Education is critical for promoting sustainable development and improving the capacity of the people to address environmental and development issues…. It is critical for achieving environmental and ethical awareness, values and attitudes, skills and behaviour consistent with sustainable development and for effective public participation in decision making."
>
> (UNCED, 1992, p.2)

Additionally, at the United Nations World Summit for Sustainable Development in 2002, governments agreed to "*integrate sustainable development into education systems at all levels of education in order to promote education as a key agent for change.*" (Parliamentary Commissioner for the Environment, 2004).

The result of this shift towards promotion of sustainable development through education has been the establishment of Education for Sustainability (EfS) as an international policy imperative (Greenall Gough, 1997; Fien, 2001). As such, education has evolved to incorporate the growing recognition of the complex interconnectedness of social, economic and environmental issues. Critical to this evolution is the way in which environmental knowledge and understanding is used in the development of practical skills.

In an attempt to define EfS, Blewitt (1998) identified four objectives of EfS. These objectives define more clearly the aims of EfS, but do not outline the practicalities of achieving such goals. The objectives included, to:

- promote awareness of and concern about economic, social, political and ecological interdependence;
- develop the knowledge, values, attitudes, commitment and skills required to achieve sustainable development;
- encourage environmentally conscious behaviour by individuals, communities and businesses; and

- support the inter-generational adoption of the principles of sustainable development.

(Blewitt, 1998)

Although the importance of EfS has been identified as a global priority, an imbalance still exists in the education sector. As outlined by Sterling (2001), the achievement of economic prosperity still dominates education and particularly VET, the prime function of which is to prepare students for economic life and to meet material needs. Despite the formation of national and state policies on EfS, practical applications of how this may be achieved are lacking.

Recent work by Coll, Taylor and Nathan (2003) provides a practical exploration of the implications of EfS for cooperative education. The model presented in this research is readily transferable to the VET setting. They suggest three ways in which EfS can be developed, through:

- experiential learning;
- transferring EfS knowledge learned in the classroom to the workplace; and
- integration of work-based EfS knowledge (learning about environmental values in the context of the work placement).

(Coll, Taylor and Nathan, 2003, p.173)

This framework may be particularly useful in VET as it acknowledges the development of practical skills and the applicability of those skills to the workplace. It also recognises the potential for conflict arising from the juxtaposed values of current workplace practices and those of sustainability. The promotion of the need for sustainable development to the workplace will play a crucial role in integration of EfS knowledge into the workplace.

2.4 International push towards Education for Sustainability

The United Nations has declared a Decade of Education for Sustainable Development (DESD) commencing in 2005. The aim of the DESD is to encourage and support all governments to integrate sustainable development into their national education plans at all levels and all sectors of education. Strategies to achieve this include: promoting the concept of Education for Sustainable Development; and encouraging international cooperation and sharing innovative policies, programmes and practices in education for sustainable development.

The Australian Governmnet has embraced the DESD as an opportunity to build and promote Education for Sustainability through:

- developing and expanding existing policies and programs;
- promoting successful Australian initiatives and expertise;
- developing national and international partnerships; and
- identifying gaps in EfS.

(Commonwealth Government, 2005)

Specific activities associated with the DESD will be developed in conjunction with the National Environmental Education Council and other stakeholders across business, government and the community.

2.5 Education for Sustainability in Australia

In 2000, the Australian Government adopted the Environmental Education for a Sustainable Future: National Action Plan. The plan outlines some fundamental principles of EfS and proposes a number of strategies aimed at improving the national approach to sustainability. It aims to provide leadership to education sectors on environmental education and to be the commencement point for national support for achieving ecologically sustainable development. It recognises the responsibility of "*government, industry, media, educational institutions, community groups – as well as individuals*" (Commonwealth Government, 2000, p.3) in achieving this goal. A key pillar of the plan is that "*the nations environmental objectives should be accorded the same priority as its social and economic objectives*" (Commonwealth Government, 2000, p.4).

The National Action Plan emphasises the need to develop practical skills that result in improved environmental outcomes, in which VET is identified as a key pathway. In particular, the plan proposes that the National Environmental Education Council (a non-statutory body which provides expert advice to Government on current and future approaches to EfS) "*establish a partnership with the Australian National Training Authority (ANTA) to develop environmental competancy standards and National Training Protocols*" (Commonwealth Government, 2000 p.9).

The states have also taken on the challenge of EfS. New South Wales (NSW) was the first Australian state to develop it's own environmental education policy, through the NSW Council on Environmental Education. Learning for Sustainability: NSW Environmental Education Plan 2002-2005 provides a framework for government and community action in environmental education which "*builds the capacity of the people of NSW to be informed and active participants in moving society towards sustainability*" (NSW Council on Environmental Education, 2002, p.1).

Other states have also shown interest in developing their own EfS plans. The need for EfS has been highlighted in the Western Australia sustainability strategy: Hope for the Future: The Western Australia State Sustainability Strategy. Victoria is also currently developing an environmental sustainability framework: Growing Victoria Together, and sustainability education and behaviour change strategy: Learning to Live Sustainably.

2.6 In summary

Sustainable development can be interpreted in a number of ways. The concept is generally accepted to be the balance between four interdependent systems: biophysical, economic, social and cultural and political (Fien, 2001). The push to recognise the importance of sustainability has come from the international arena through the United Nations. Australia has recognised its role in promoting sustainability and has adopted the Intergovernmental Agreement on the Environment (IGAE) and the National Strategy for Ecologically Sustainable Development (NSESD). Yet, despite the recognised need for the incorporation of sustainability principles into our daily and working lives, there is widespread misunderstanding and misuse of the concept.

Education has been identified as key to the implementation of sustainable development. As a result, Education for Sustainability (EfS) has been adopted as an international policy imperative (Greenall Gough, 1997). The aims of EfS are to promote awareness of sustainability; develop knowledge, values, attitudes, commitment and skills for sustainability; encourage environmentally conscious behaviour; and generate inter-generational recognition of the need for sustainability (Blewitt, 1998). Australia's commitment to EfS is defined in the National Action Plan in which VET is identified as an essential pathway to achieving sustainability.

3 Education for Sustainability and the Future Nature of Work

3.1 Introduction

The working environment is changing at a rapid pace and despite the need for more highly skilled workers, training in Australian industry is decreasing (ABS, 1997). There is now a heightened need to understand the relationship between work and skill development. However, the ability of VET in Australia to address workplace needs has been hampered by the lack of an overarching policy development and implementation framework. Changes are required to VET if it is to meet the shifting demands of industry.

3.2 The changing nature of work

Globalisation and technology are rapidly changing the workforce (Robinson, 2003). Over the last twenty years there has been a significant decline in goods-producing industries and a dramatic rise in knowledge-based service industries (Wooden, 2002). Accompanying these changes is the growth in non-standard employment characteised by part-time, temporary, casual and contract work (Wooden, 2002) to the extent that Australia now has one of the most casualised workforces in the world (Robinson, 2003). The growing mobility of workers has resulted in an increased need for multi-skilling and in particular, the development of higher-order skills.

However, restructuring of the workforce to flatter organisational structures has resulted in a polarisation of skills where few workers have the opportunity to develop creativity and problem solving skills and most are relegated to the lower-levels of the organisation (Loyd and Payne, 2002; Buchannan et al, 2001). These changes have resulted in a reduction in structured workplace training (ABS, 1997) and challenged the notion of the 'knowledge economy'. Workers are simply not being equipped with the diverse set of skills required to develop to their full potential.

3.3 Skills policy: meeting workplace demands

Recent research by the NSW Board of Vocational Education and Training (BVET) establishes some key understandings of the relationship between the workplace and skill development. This report identifies three 'logics' of skill, shaped by education and the labour market:

- ✧ cognitive skills – foundational skills, obtained through general competency education;
- ✧ technical skills – skills 'purchased' in the labour market; and
- ✧ behavioural skills – how the worker performs on the job and their relationship and interaction in the workplace.

(BVET, 2001)

The report also introduced the concept of the skill ecosystem, which acknowledges the environmental factors influencing skill development, including the business environment, technology, government, the labour market, production processes and the quality of education and training (DEST, 2005). The skill ecosystem project focuses on what employers and the training system can do to develop a lasting skilled workforce. With this aim, the concept of holistic, lifelong learning is introduced where the combination of skills and knowledge with environmental, cultural and structural factors is recognised to nurture high-performance, high value added industries (BVET, 2001).

However, the ability of VET to address workplace needs and develop the skill ecosystem has been hampered by the lack of an overarching policy development and implementation framework within Australia. The sector specific, portfolio specific and reactive approach to sustainability in Australian has resulted in public policy divide. This problem has been overcome in other countries such as England, where the development of a sustainability action plan has engendered an all of government approach which partners with education providers, industry and other stakeholders to ensure that all individuals have the capacity to create a more sustainable society (Department for Education and Skills, 2003).

3.4 Pursuing change in VET

The need for VET to evolve and embrace globalisation and technological change and meet the needs of the workforce of the future has been identified as key to the establishment of sustainability in workplace culture (UNCED, 1992). Vocational education and training has the potential to foster change within the workplace by providing students with the cognitive, technical and behavioural skills necessary to promote sustainable development, but this can only be achieved through revision of institutions and curriculum (Fien and Wilson, 2005). The skills required of workers of tomorrow will be vastly different from those currently being developed in VET (Fien and Wilson, 2005).

In particular, the growing significance of sustainability is impacting on VET, demanding the renewal of skills, analysis of labour market requirements and the transformation of the workforce (Fien and Wilson, 2005). Thus, education for 'jobs' and competency based assessment is being challenged by the need to also build human capital (Lawrence, 1997). VET has the opportunity to address workforce needs, incorporate sustainability principles into teaching and learning and lead the way in EfS in Australia.

The advent of the information age and growth of the knowledge economy focuses on industry and business strengths in knowledge rather than capital (Fien and Wilson, 2005). The demands of EfS create new roles and courses in VET which combine an understanding of the pillars of sustainability and technical knowledge (Fien and Wilson, 2005). Current industry engagement with sustainability processes is taking place without VET involvement, community organisations and industry are developing their own courses in sustainability, yet a standardised package still does not exist (Newman et al, 2004).

The integration of sustainability by the VET sector could address the future needs of workplaces and meet the increasing demand for staff with skills in this area (Newman et al, 2004). Widespread education in sustainability and the resultant development of comprehensive skills could also improve the quality of life and working life (Newman et al, 2004). Unfortunately, the realisation of an integrative EfS policy in Australia has been slow to progress despite the adoption of the National Action Plan and the push towards sustainability from other organisations such as ANTA. ANTA's review of training packages *has* examined the effect of changes in the labour market, work practices, technology and organisational structure on the demand for skills (Hind, 2004), yet their approach to EfS remains unchanged.

3.5 Challenges facing EfS in VET

There are a range of challenges facing EfS in VET. Effective education for sustainability in Australia will be dependant on institutions ability to incorporate both conceptual and technical learning into courses, address the dynamicism of sustainable development and overcome current fragmented practices in EfS.

Sustainable development is an evolving concept, knowledge and understanding of the interactions between economy, environment, society and policy continues to improve, presenting a challenge for VET to be continually innovative. Therefore the integration of EfS into VET needs to be flexible, adaptive, interdisciplinary, collaborative, experiential, locally relevant, value-oriented and future, action and learner oriented (Newman et al, 2004). The complexity and enormity of this task suggests that education providers must be supported by government, industry and the community in the implementation of EfS.

Sustainable development is more of a principle than a science, it is a matter of culture rather than technical ability (Fien and Wilson, 2005). Education for sustainable development therefore is not as simple as shaping skills, but requires a shift in mindset in both teaching and learning (LSC, 2005). This is particularly evident in VET which has traditionally focused on productivism, the preparedness of students for work and the development of practical skills and technical measures (Anderson, 2003).

The establishment of EfS into VET is not supported by an institutional framework, nor is it addressed in the national VET strategy (ARIES, 2004). To overcome this perceptual barrier, the principles of sustainability must be embedded in policy, planning, teaching and learning across VET (ARIES, 2004). There is a distinct need to develop generic standards in EfS and encourage the inclusion of innovation and sustainability in all training packages (ARIES, 2004). Ideally, the establishment of EfS in VET should be implemented in a manner similar to that of occupational health and safety (Newman et al, 2004).

However, knowledge of and experience in EfS in VET is limited and the approach to sustainability is fragmented (ARIES, 2004). To overcome this, the VET sector will have to shift from the current reactive approach to skill development to a more strategic, proactive and long-term view approach (ARIES, 2004). Such reorientation of courses and programs to address EfS objectives should enable students to develop an understanding of environmental concepts, encourage reflection on personal values and lifestyle choice and promote skills for critical thinking and practical action (Fien and Wilson, 2005). In doing so, graduates would be equipped with the multitude of skills increasingly demanded by the workforce and would be better prepared for their working lives.

3.6 In summary

Gloablisation and technology are rapidly changing the workforce; increased casualisation and the growing mobility of workers (Robinson, 2003) has resulted in an increased need for multi-skilling and in particular, the development of higher-order skills. However, workers are simply not being equipped with the diverse set of skills required to meet industry needs and to develop their full potential. The focus in skills training has shifted from technical competency to also include cognitive and behavioural skills, a change which VET has been slow to embrace.

VET has the potential to foster change within the workplace by providing students with the cognitive, technical and behavioural skills necessary to promote sustainable development, but this can only be achieved through revision of institutions and curriculum (Fien and Wilson, 2005). Current industry engagement with sustainability processes is taking place without VET

involvement. There are a range of opportunities and challenges regarding the establishment of EfS in VET within Australia. Education for Sustainability is not as simple as shaping skills, but requires a shift in mindset in both teaching and learning (LSC, 2005). This is particularly evident in VET which has traditionally focused on productivism, the preparedness of students for work and the development of practical skills and technical measures (Anderson, 2003).

4 Sustainable Development and Technical and Vocational Education and Training (TVET) – International Trends

4.1 Introduction

Following the international push for sustainable development and recognition of the integral role of education in achieving this outcome, the theory and practice of VET for sustainability has emerged. The United Nations Education, Scientific and Cultural Organisation (UNESCO) is a key driver in international policy regarding education for Sustainability (EfS). Partnering with other organisations such as the International Labour Organisation (ILO), UNESCO has set an agenda for the integration of sustainability into vocational education and training (VET). In line with these initiatives, a number of countries including England and Canada have established frameworks for EfS in VET.

4.2 International policy initiatives

Sustainable development has been an issue of international debate since the publication of Our Common Future: The World Commission on Environment and Development (1987). The need for, and importance of, Education for Sustainability (EfS) has evolved from this time and has become an international policy imperative. A range of organisations have expressed the need for an increased focus on sustainability in education, especially in Technical and Vocational Education and Training (TVET).

The Second International Conference on Technical and Vocational Education (1999) specifically discussed the concept of lifelong learning and role of TVET in promoting environmentally sustainable behaviour. In particular, it was acknowledged that TVET has a crucial role to play in the realisation of sound sustainable development (UNESCO, 1999, p.61). The basic premise behind EfS in VET is to establish a learning culture. The role of the educational institution is therefore to prepare individuals for employment *and* to educate them in being responsible citizens who care for their environment and the well being of others (UNESCO, 1999, p.27).

The transformation of VET can be achieved by incorporating new subjects (issues) into teaching and learning; and broadening the education task to encompass a whole of workforce development approach. Further, the World Summit on Sustainable Development (2002) concluded that it is essential for all countries to develop capacity in training, practical skills and educational institutions to promote "*economically viable, socially acceptable and environmentally sound"* development (World Summit on Sustainable Development: Final Report, 2002).

As a result, the International Labour Organisation (ILO) and UNESCO developed three goals for VET, to:

- ✧ contribute to sustainable development and develop the skills of individuals to participate in sustainable behaviour;
- ✧ develop individuals knowledge of sustainable development to improve their understanding of the environment, their ability to think critically about sustainability issues and their capacity to act in a sustainable manner; and
- ✧ empower individuals to contribute to sustainable development in all aspects of their lives.

(UNESCO and ILO, 2002)

The UNESCO-UNEVOC International Centre for Technical and Vocational Education has suggested that vocational education has a significant role to play in the implementation of EfS and that priority must be given to TVET initiatives that promote sustainable development (Bonn Declaration: UNESCO, 2004). To this end, a ten year action plan was developed to facilitate that reorientation of technical and vocational education towards sustainable development during the Decade of Education for Sustainable Development (DESD). The Action Plan proposed seven interlinked strategies and a range of activities for EfS in TVET, these included:

- ✧ advocacy of the issues related to EfS;
- ✧ review and development of TVET policies;
- ✧ development of guidelines for planning and implementation;
- ✧ undertaking capacity building and training programmes;
- ✧ development of learning support materials, resources and equipment;
- ✧ strengthening of networking and partnerships in TVET; and
- ✧ ongoing monitoring, evaluation and research.

(UNESCO International Experts Meeting, 2004)

4.3 Cases in national policy and research

The growing prominence of EfS has resulted in the development of environmental education policies across a number of countries. England provides a good example of a comprehensive approach to national policy for the integration of sustainability themes into VET. Additionally, studies have been undertaken in Canada which examine curriculum planning in relation to EfS.

4.3.1 England: Learning to Last

The Sustainable Development Action Plan for Education and Skills (2003) provides a framework for the integration of sustainability into education in England. As a result, all sectors of education including schools, VET and higher education institutions have developed their own individual processes and programmes to implement EfS. The plan suggests:

- ✧ inter-organisational agreement to ensure that guidance and tools for development are readily accessible; and
- ✧ incorporation of sustainable development skills training into apprenticeships, other learning frameworks and national occupation standards.

(Department for Education and Skills, 2003)

The success of the plan is underpinned by an integrative approach in which a range of organisations worked with communities, employers and colleagues to develop and improve the integration of sustainability into relevant courses and the practices of institutions. As a means of implementing the plan, the Learning and Skills Council developed a toolkit which helps practitioners to learn more about education and sustainable development, promotes networking and offers guidance on the development, management and evaluation of sustainability projects. Additionally, a range of initiatives have been identified that aim to promote EfS:

- development of centres of excellence where a culture of sustainable development is embedded in the curriculum;
- incorporation of sustainable development values into leadership and management programmes;
- inclusion of sustainable development into VET teacher training programmes and new curriculum frameworks; and
- contribution to the development of sustainable communities.

(Cohen, 2004)

The drive for EfS in England is complemented by research by Egan (2004) which identifies the generic skills, behaviour and knowledge that are of prime importance to building sustainable communities. This research provides an indication of the type of skills that should be incorporated into sustainable development curriculum, including:

- the ability to create a vision;
- leadership to achieve buy-in to the vision;
- communication;
- teamworking;
- project management;
- process reengineering;
- understanding sustainable development;
- effective financial management; and
- understanding the economics of development and the processes of local democracy.

(Egan, 2004)

4.3.2 Canada: Skills to Last

Research by Clayton and Blom (2004) has resulted in the development of a Sustainable Development Skills Profile (SDSP) for the Canadian workforce which is centred on the development of essential knowledge, skills and attitudes (KSAs) necessary for the workforce to apply the principles of sustainable development in their day-to-day practices. The study identified skills in sustainable development required by the Canadian workforce related to environment, society and economy.

Six central themes emerged from the research: ethics and values; integrated decision making; responsible use of resources; valuing diversity; safety and well-being; and continual improvement. These themes were used to organise and classify the KSAs into a framework broadly applicable to general education, adult education and TVET. The SDSP can be used to develop performance indicators, curriculum, training programs, self-assessment tools and needs assessment instruments.

The study by Clayton and Blom (2004) was the first systematic attempt made to identify the essential sustainable development knowledge, skills and attitudes needed by the workforce and to identify a direction for the development of EfS in VET. The study suggested that the KSAs should be incorporated into workforce development and training to encourage the adoption of sustainable behaviours and values.

4.4 In summary

The concept of lifelong learning is central to EfS policy. UNESCO has acknowledged that the establishment of EfS in VET requires the development of a learning culture where individuals are prepared for employment and educated about being a responsible citizen. The importance of EfS on the international front has been established through the UNESCO-UNEVOC Action Plan for the Decade of Education for Sustainable Development. The Plan focuses on the promotion of EfS and sustainability issues; review of VET policy; development of EfS in VET and the capacity to provide EfS; and ongoing evaluation of EfS approaches. Research in England and Canada has provided some direction for the implementation of EfS, although work in this area continues.

5 National Policy on Sustainability and VET

5.1 Introduction

Policy can be a driver or barrier to the implementation of Education for Sustainability. Australia's policy on sustainability is contained in the Intergovernmental Agreement on the Environment (IGAE) and the National Strategy for Ecologically Sustainable Development (NSESD). However, the concept is still not widely understood or utilised in Australia. The portfolio approach to policy regarding sustainability has resulted in a fragmented implementation of the principles, especially for EfS. An over-arching, whole-of-government approach is required to effectively promote sustainable development.

5.2 National sustainability policy

Australia's national sustainability policy is defined in the Intergovernmental Agreement on the Environment (IGAE) and the National Strategy for Ecologically Sustainable Development (NSESD). These documents outline the broad strategic directions and a framework for sustainable development to be directly incorporated into policy and decision-making at the state and national level. However, several authors have discussed their disappointment in the failure of the Commonwealth to engage further in the development and implementation of sustainability policy.

Despite the establishment of the NSESD and IGAE, the concept of sustainable development is still not well understood outside of limited environmental circles and a whole-of-government commitment is lacking (Fien, 2001). In fact, some authors have noted that sustainability policy in Australia seems to be at a standstill (Yencken, 2000). Yencken (2000) proposes that sustainability policy should be repositioned as an overarching policy, outside of single portfolios and Fien (2001) has suggested that the development of environmental education policy outside of DEST (currently the responsibility of the Department of Environment and Heritage) limits its influence.

5.3 VET policy in Australia

VET policy in Australia is primarily shaped by the *Australian National Training Authority Act* 1992. The Act establishes the role of the Australian National Training Authority (ANTA) and includes the ANTA Agreement which binds State VET systems to the National Training Framework. Although ANTA was abolished in July 2005, all responsibilities and functions of the Authority passed to the Department of Education, Science and Training (DEST).

ANTA worked closely with government, industry and other stakeholders to ensure that the skills of the workforce were sufficient to meet the needs of industry and the individual. In 2003 ANTA released Shaping Our Future: Australia's national strategy for vocational education and training 2004-2010 which sets the strategy for VET to 2010. The strategy constitutes the government's commitment to continue to work in partnership with industry, providers and other stakeholders to develop VET across Australia.

The vision of the national strategy includes:

- ✧ making businesses internationally competitive;
- ✧ giving Australians world-class skills and knowledge; and
- ✧ building inclusive and sustainable communities.

(ANTA, 2003)

Since taking over the responsibility for VET policy, the Department of Education, Science and Training has introduced a new national training system: Skilling Australia's Workforce. The framework sets out the terms and conditions of funding appropriated under the new vocational education and training legislation and the Commonwealth and State government's commitment to work collaboratively to support the long-term objectives as set out in Shaping Our Future (DEST, 2005).

5.4 Education for Sustainability: policy

The national approach to EfS is defined in Environmental Education for a Sustainable Future: National Action Plan, which proposes a number of strategies aimed at improving the national approach to sustainability. The plan focuses on raising the profile of environmental education, through:

- ✧ the National Environmental Education Council (comprising experts in environmental education and eminent community leaders), which provides advice to the Minister for the Environment and Heritage and identifies priority environmental education issues and research needs;
- ✧ the Australian Research Institute for Education for Sustainability (ARIES) which ensures that environmental education initiatives are coordinated, environmental education resource material are improved, more opportunities are provided for teacher professional development and environmental education becomes more integrated within mainstream education and VET;
- ✧ promoting the importance of EfS;
- ✧ establishment of an intergovernmental environmental education network and environmental education working group; and
- ✧ the establishment of the Environmental Education Grants Programme.

(DEH, 2000)

The Environmental Education Grants Programme provides funding to projects that either enhances the effectiveness of existing environmental education programmes, policies, systems or institutions; or develops new and innovative approaches in environmental education (DEH, 2005). The Programme provides incentives for the adoption of sustainable development principles by community, business, industry and other stakeholders. Funds devoted to the programme are limited, however between 2002 and 2005 over half a million dollars have been provided under the Programme to projects that have increased awareness of sustainability in

education; developed knowledge and new perspectives on EfS; engendered EfS values and skills; and encouraged sustainable behaviour.

5.5 In summary

Currently Australia's national sustainability policy within VET is weak due to the separation of policy decision on VET and Sustainability. Sustainability policy is centred in one government department, the Department of Environment and Heritage, while Australia's approach to VET is the responsibility of another department, the Department of Education, Science and Training. There is currently no dialogue between the two, resulting in a fragmented and haphazard approach to Sustainability and EfS. The true establishment of sustainable development and the promotion of sustainability principles require a whole-of-government approach, unrestricted by portfolio boundaries and inconsistencies.

6 VET Learning and Teaching: Building a model for the future

6.1 Introduction

The government push for a demand driven training system has required VET institutions to become more flexible, customer-focused and business-like to keep pace with industry needs (Waters, 2005). Sweeping reforms, including competency-based training, industry defined occupational standards, nationally recognised qualifications, the establishment of training packages and the Australian Qualifications Training Framework have aimed to increase the relevance and effectiveness of VET (Waters, 2005).

VET institutions operate in a more competitive market where there is an increased demand for higher quality and relevant courses to be on offer (NCVER, 2004).

Changes to the workplace have not been addressed by educational models and practices in VET, some of the new skills required are markedly different from those formally provided by the sector (Chappell, 2003).

6.2 Living in the past: VET pedagogy

Pedagogy involves "*the teacher's role, the relationship between teacher and learner, the learning process and the learning context*" (Waters, 2005, p. 4). It encompasses the broad strategies and principles employed in teaching. In the past, VET has been focused on teaching rather than learning. A transmission approach is accepted, the teacher imparts knowledge to students through modules, competency standards, programs and courses (Chappell, 2003). This andragogical approach has shaped VET pedagogy based on behavioural and cognitive psychology and is heavily focused on skills (Waters, 2005).

Competency based training emerged in Australia and other western countries in a response to government and industry pressure to address skills shortages (Barlow, 2005). The basic principles of which are:

- ✧ learning to industry defined standards;
- ✧ partnership with industry;
- ✧ use of adult learning principles;
- ✧ learner-centred approach; and
- ✧ flexible delivery.

(Barlow, 2005)

This model saw VET develop a central purpose to prepare individuals for work, where they could contribute to productivity and economic growth (Waters, 2005). The restrictive structure enforced on VET valued technical competency above cognitive thinking and resulted in an undervaluing of vocational knowledge (Dryden, 2004). This focus in the curricula does not fully equip individuals with the skills increasingly being demanded in the workplace:

> "in VET there is still a focus on imparting knowledge and an underlying teacher-centred pedagogy characterised by rigid structure, controlled progress through a lock-step process, poor integration of theory and practice, and testing or assessment with little or no relevance to competency standards."

(Dryden, 2004, p.11)

Further, competency based programs grounded in training packages, are developed to occupational standards and national qualifications but are so arduous that practices can become obsolete before they are implemented (Chappell). The traditional approaches to VET must be improved if demands of industry are to be met: "*Current VET industrial awards, performance indicators and funding models… have not kept pace with the new ways practitioners are working*" (NCVER, 2004 p.1).

6.3 The changing role of VET: diverse approaches

Following increasing concern regarding the consistency, flexibility and quality of VET delivery (Clayton and Blom), pedagogy in VET is being questioned. As such there is a growing view that VET should address social and other aspects of learning as much as economic functions (Waters, 2005). The notion of knowledge has changed, the term no longer refers to the development of technical skills but encompasses a combination of personal characteristics and skill sets (Waters, 2005). It is now recognised that workers require higher-order skills that enable creative, innovative and critical thinking in addition to basic competencies (Waters, 2005).

Questions have been raised about the ability of competency based training to develop these types of skills and knowledge and there is a push for VET to move towards a constructivist approach making the andragogical and pedagogical approaches redundant (Waters, 2005). The resultant shift in the relative importance of cognitive, technical and behavioural competencies has caused a shift in focus for teaching and learning (Dryden, 2004). This shift is beginning to see an emphasis on:

- ✧ workplace learning;
- ✧ vocational outcomes (approach to work rather than technical knowledge);
- ✧ developing people;
- ✧ learner-centred, work-centred and attribute focused teaching; and
- ✧ the use of constructive rather than transformative learning.

(Chappell, 2003)

However, it is increasingly being recognised that the approach to learning and teaching in VET must take account of a range of styles to meet the needs of individual learners. Chappell (2003) has suggested that a mosaic of transmission, acquisition and constructive learning approaches should be used to achieve outcomes relevant to the changing workplace.

6.4 VET pedagogy and EfS

The increasing value of knowledge outside of traditional VET offerings in the workplace has resulted in the recognition of the need for VET to provide generic skill development as well as job specific skills (Dryden, 2004). The ability of institutions to take advantage of this opportunity is limited however by Training Packages, which are unclear about how to develop and assess generic skills (Waters, 2005). The challenge for VET is to find a way to make the abstract real (Kent, 2004).

The current VET policy responds to industry skills needs and comes at the cost of developing a skills set (NCVER, 2004). If VET is to respond to the growing need for non-specific skills and capabilities, this reactive approach must be replaced by a more sustainable, long-term, strategic perspective (NCVER, 2004). Specifically, apprentices and other students should be given the opportunity to develop a range of skills and a greater depth of understanding than is currently offered by VET (Dryden, 2004).

Education for sustainability can be integrated into the VET framework as generic skills. However, the way forward posted for VET in Australia does not explicitly address sustainability. Integration of sustainability principles into VET operations, administration and curricula can be achieved through a less rigid framework than that currently employed through Training Packages (Kent, 2004). The formation of partnerships with industry, government and the community can also be used to strengthen the approach to sustainability (Kent, 2004).

Although the establishment of EfS in VET is embedded in national policy, current understanding of the concept is limited and the approach to sustainability is fragmented (ARIES, 2004). Flexible and learner-centred programs such as EfS demand an integrated, whole-of-organisation approach (NCVER, 2004), it is not sufficient to merely tack generic components of courses onto existing curricula (Chappell, 2003). However, the acknowledgement of the need to address generic skills in VET should ease the way for the integration of EfS into VET.

6.5 In summary

VET pedagogy is grounded in a transmission model of teaching. In response to industry and government pressure, the model has developed into one of competency based training but the rigidity of the Training Package structure has reduced the ability to develop and assess generic skills. Industry is rapidly changing and the demand for individuals with a diverse skill set is increasing. Value is now placed on the combination of cognitive, behavioural and technical skills of individuals and the notion of knowledge has evolved to encompass personal and professional development.

The recognised need by providers to embed generic skills into courses has opened the door for EfS integration into VET in a manner similar to that of occupational health and safety and life skills components. However the principles of sustainability must be integrated across Training Packages in an overarching manner to be effective.

7 Generic Skill Development

7.1 Introduction

Gibb and Curtin (2004) define generic skills as "*those skills essential for employment and for personal development, fulfilment, community life and active citizenship*" (p.7). Traditionally VET was preoccupied with the development of technical skills in workers, but with rise of the knowledge-based economy the importance of cognitive and behavioural skills has grown (often referred to as employability skills). Delivery and assessment of these skills in VET has always been vexed from a practical implementation process (Down, 2004).

Curtis (2004) argues that "*effective methods for teaching or otherwise developing employability skills remain to be articulated*" (p.19). Further, Clayton et al (2004), question whether efforts to extend generic employability skills will be effective as they remain "*undervalued by learners and employers*". Tension also exists between VET policymakers, who have a strong focus on the skill needs of industry and the economy, and VET practitioners, who tend to take a more holistic approach to broad-based skills development which extends beyond work to "*social and civic participation*" (Virgonia & Waterhouse, 2004, p.111). In response to the problem, Down (2004) calls for industry, ANTA and VET practitioners to partner in the development of generic employability skills.

7.2 Generic skills and EFS

Government has taken a keen interest in employability skills and is working to embed these skills in industry training packages (Down, 2004) and in the entire education pathway. As a result, generic employability skills are now front and centre in VET policy making (ANTA, 2004c, p.4). The acceptance of skill requirements that apply equally to work as to life, opens an opportunity for the recognition of skills for sustainability. Generic skills that develop an understanding of a range of environmental concepts in the workplace; envisioning and devising alternative methods of working and action; negotiation and justifying desirable changes with work colleagues and supervisors.

However, generic sustainability skills are likely to encounter the same problems in being integrated and embedded into Training Packages and teaching as the earlier employability skills. To overcome this problem, there is growing recognition that the workplace and workplace culture are instrumental in generic employability skill development (Virgona & Waterhouse, 2004: Chappell et al, 2003). If EFS is embedded in VET and workplace culture, rather than tacked-on there is a greater chance that sustainable development can be achieved.

7.3 National training packages – vehicles of VET policy

VET reform of the 1990s was best defined by the move away from a content-focused VET curriculum to competency-based (or outcome-focused) training through National Training Packages. These provide the 'architecture' of the VET systems as they specify the competencies

that must be learned, the industry requirements for assessment and the national qualifications attained. Competency standards "*describe the knowledge, skills and personal attributes needed in a specific area of work and the standard of work expected*" (Dawe, 2004,p.73). Under the ANTA agreement, one of the conditions for states to receive Commonwealth funding is that they deliver national training package qualifications (Wheelahan, 2003). The recent high level review of Training Packages conducted by ANTA has committed the Australian VET system to this system for at least the next decade (ANTA, 2004c).

Several authors (Wheelman, 2003; Chappell et al, 2003; Anderson, 2003) have questioned the ability of Training Packages to deliver the full range of employee knowledge, skills and capabilities required for work in the 'knowledge' society. Wheelahan (2004) and Newman et al (2004) in particular believe that Training Packages are not capable of preparing workers for a society characterised by change and new technological development. TAFE NSW (2000) has acknowledged that they have failed to keep pace with industrial changes especially in the areas of environmental management and sustainability (Peterson, 2004, p.4).

Rickard and Condon (2005) have evaluated the current status of EFS within industry training packages in Australia and have found that the regulatory environment is a principal driver of environmental competency development within Training Packages (p.23). Further, a study conducted by TAFE NSW, Environmental Content in Vocational Education and Training (Russell, 2003) identified significant gaps in National Training Packages in the context of national and state environmental education and ecologically sustainable development policies and strategies.

To counter these problems, the consultation process in developing Training Packages needs to include environmental specialists, scientists, engineers and economists (Rickard & Condon, 2005). Curriculum development needs to ensure an appropriate balance between policy-driven contents (on socio-economic, environment and development goals and values of education) and employment-driven contents in units (Newman et al, 2004).

7.4 Opportunities for VET

EfS is recognised as a global and national catalyst for regeneration of communities and growth of new and established businesses. Consequently businesses, community organisations and industry are developing their own courses in sustainability. Current industry engagement with sustainability processes is taking place without VET involvement, in a 'bottom-up' movement. There is an opportunity for VET to move in with a standardised package to take advantage of the push for education in sustainable development. The introduction and integration of a sustainability unit is envisaged as being similar to the integration of OH&S, which is required of all learners and apprentices (Newman et al, 2004).

The demands of EFS create new roles and courses in VET as it requires workers to have a knowledge of sustainability as well as requisite technical knowledge. VET must produce a workforce "*that knows how global changes also impact upon the quality of local social, economic and environmental conditions*" (Fien & Wilson,2004, p.10). Rickard and Condon (2005) discuss the opportunity of incorporating resource use through supply chains which provide insight into the Triple Bottom Line impacts of consumption into training packages. Small businesses, particularly in regional Australia, are recognised as needing learning and training in Triple Bottom Line reporting and practices (Newman et al, 2004).

7.5 Strategies underway to implement EFS into VET

In Western Australia the Department of Education and Training has commissioned Murdoch University and Green Skills to develop a strategy for how the VET sector in WA can respond to sustainability. They recommend a core capability unit in Sustainability be developed in collaboration with other states and DEST. New learning materials must reflect information on how sustainability relates to VET learners future roles in the community and the workforce; sustainable technologies; and possibilities for innovation. Current courses need to be assessed in terms of the training products and services provided to ensure their sustainability competencies meet the requirements of new sustainability workers.

The National Centre for Sustainability at Swinburne University of Technology has developed a guide for VET staff on how to align their teaching with the principles of sustainability and provide guidelines for integrating sustainability into the VET sector.

Challenger TAFE is developing guidelines to holistically embed sustainability into VET courses through a 'Reframing the Future' research grant. EcoRecycle Victoria, DEST and the NSW Department of Environment and Conservation are developing competency standards to suit the needs of industry training packages and to build knowledge of sustainable production and consumption for business (Newman et al, 2004, chapter 16).

7.6 In summary

The rise of the knowledge economy has increased the importance of employability skills to industry. However the delivery and assessment of these skills in VET has always been problematic due to the establishment of Training Packages set to guide VET over the next decade. Several authors (Wheelman, 2003; Chappell et al, 2003; Anderson, 2003) have questioned the ability of Training Packages to deliver employability skills and prepare workers for a society characterised by change and new technological development. TAFE NSW (2000) has itself acknowledged that they have failed to keep pace with industrial changes especially in the areas of environmental management and sustainability (Peterson, 2004, p.4).

Significant gaps have been identified in National Training Packages in the context of national and state environmental education and ecologically sustainable development policies and strategies. To counter these problems, Training Packages need to be re-evaluated in consultation with environmental specialists, scientists, engineers and economists (Rickard & Condon, 2005) to ensure an appropriate balance between economic, social, environmental and political units (Newman et al,2004).

There is an opportunity for VET to develop a standardised package for EfS through the introduction and integration of sustainability principles. The demands of Efs create new roles and courses in VET to produce a workforce with a balance of employability and technical skills.

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