The Global Values within
Education for Sustainable Development

A Case Study of Education for Sustainable Development
in the Australian National Curriculum

Volume 1

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ABSTRACT

History shows that society looks to education to develop the values, knowledge and skills needed to address contemporary challenges and to create the kind of society and lifestyles that are appropriate to the time, place and context. This is particularly so in times of crisis and rapid change such as those encountered today. The inter-related issues of climate change, environmental degradation, globalisation and the global financial crisis (GFC), population explosion, growing intercultural and inter-religious conflict, and increasing social concerns and inequities, confront education with many complex challenges.

This policy-oriented study examines the nature of these global challenges and ways of addressing them through values-based Education for Sustainable Development (ESD), with specific reference to key international documents and reports. It identifies the most commonly expressed values, knowledge and skills involved in Education for Sustainable Development (ESD) in a selection of United Nations (UN) documents and international agreements relevant to key socio-cultural, socio-economic, and environmental perspectives of sustainable development. These are collated, analysed and presented as a guide for schooling to address, while complementing local cultural and national values. The global values are compared to Australian values, with those in the National Framework for Values Education in Australian schools (NFVE), and in the Australian National Curriculum for schooling.

From an extended examination of international and Australian documents, and the work of scholars in the field, this study reviews the educational thinking that led to current concepts of Education for Sustainable Development (ESD), with particular emphasis on values. It is argued that schools operate in three ways, by what they teach, by how they teach and by the kind of place the school is, which are examined in this study in terms of quality and effectiveness for values-based teaching and learning for a sustainable future.

An investigation of the Australian National Curriculum for Schooling is undertaken as a case study to test: (a) the global values for ESD identified from UN documents; (b) the knowledge and skills for ESD gleaned from relevant international and Australian documents; and (c) the quality characteristics of ESD identified in this study, to form

evaluative criteria for implementing values-based ESD. The analysis examines the extent to which the Australian National Curriculum is designed to service the goal of sustainable development, with recommended modifications and adjustments. The Australian National Curriculum is also tested against a philosophical and values-based framework for its coherence, consistency and strength, and particularly, for its usefulness in creating a peaceful, just and sustainable society.

It is argued that the issues addressed by Education for Sustainable Development are too important to be under-represented in the Australian National Curriculum, and merit serious and thorough consideration in the context of a rapidly changing world. Although this study discusses the nature of school-based Education for Sustainable Development, the underpinning principles and evaluative criteria for ESD may be extended to all levels of education.

The Appendixes that accompany this study are contained in a separate volume for easy reference and are designed to be referred to alongside the text in this volume.

DECLARATION

This work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

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DEDICATION

To the educators who work tirelessly for the development of the children in their classes.

To the learners who will become the citizens, workers and leaders of the future.

To my son, Simon and his children, and their children.

May they contribute to, and benefit from, the creation of a more peaceful, just and sustainable world.

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ACRONYMS

AARE	Australian Association for Research in Education
AAS	Australian Academy of Science
ABS	Australian Bureau of Statistics
ACARA	Australian Curriculum Assessment and Reporting Authority
ACCU	Asia Pacific Cultural Centre for Unesco
ACER	Australian Council for Educational Research
AEC	Australian Education Council
AGPS	Australian Government Publishing Service
AI	Amnesty International
APCEIU	Asia Pacific Centre for Education for International Understanding
APNIEVE	Asia Pacific Network for International Education and Values Education
ARIES	Australian Research Institute for Environment and Sustainability
ASEP	Australian Science Education Project
ATSI	Australian Aboriginal and Torres Strait Islander peoples
AuSSI	Australian Sustainable Schools Initiative
BBC	British Broadcasting Commission
BCE	Before the Common, Christian or Current Era
CAP	Canadian Association of Principals
CCWA	Curriculum Council of Western Australia
CDC	Curriculum Development Centre (Australia)
CEL	Center for Ecoliteracy (USA)
CIRET	International Centre for Transdisciplinary Studies and Research
CPWR	Council of the Parliament of the World's Religions
DECS	South Australian Department of Education and Children's Services
DEET	Northern Territory Department of Employment, Education and Training
DEEWR	Department of Education, Employment and Workplace Relations
DEH	Department of Environment and Heritage (Australian)
DESD	United Nations Decade of Education for Sustainable Development (2005-2014)
DEST	Department of Education Science and Training
DEWHA	Department of the Environment, Water, Heritage and the Arts
DIC	Department of Immigration and Citizenship

DNA	Deoxyribonucleic Acid (i.e. genetic code for all life forms)
ECI	The Earth Charter Initiative
EE	Environmental Education
EFA	Education For All
EfS	Education for Sustainability
EIU	Education for International Understanding
EPD	Environment, Population and Information for Human Development Project
ESD	Education for Sustainable Development
ESF	Education for a Sustainable Future
GFC	Global Financial Crisis
HDI	Human Development Index
HDR	Human Development Report
HENT	Holistic Education Network of Tasmania
HIV/AIDS	Human Immunodeficiency Virus and Acquired Immune Deficiency Syndrome
HPI	Human Poverty Index
HRE	Human Rights Education
IBE	International Bureau of Education
ICE	International Conference on Education
ICES	International Conference on Environment and Society
ICT	Information and Communication Technology
IEEP	International Environmental Education Programme
IIS	International Implementation Scheme for the United Nations Decade of Education for Sustainable Development (2005-2014)
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for the Conservation of Nature and Natural Resources
MCEETYA	Ministerial Council for Education Employment Training and Youth Affairs
MCEECDYA	Ministerial Council, Education Early Childhood Development and Youth Affairs
MDGs	United Nations Millennium Development Goals
NCB	National Curriculum Board
NFVE	National Framework for Values Education in Australian Schools
NGO	Non-Government Organisation
OECD	Organisation for Economic Cooperation and Development
OHCHR	Office of the UN High Commissioner for Human Rights

PDF	Portable Document Format
SACSA	South Australian Curriculum Standards and Accountability Framework
SD	Sustainable Development
SEMP	School Environment Management Plan
SOSE	Studies of Society and Environment (Learning area in Australian schooling)
TELS	Tasmanian Essential Learnings
UDHR	Universal Declaration of Human Rights
UK	United Kingdom
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNCHE	United Nations Conference on the Human Environment
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
Unesco	United Nations Educational, Scientific and Cultural Organization
UNEVOC	International Centre for Technical and Vocational Education and Training
UNHCHR	United Nations High Commission for Human Rights
UNLD	United Nations Literacy Decade
USA	United States of America
VCAA	Victorian Curriculum and Assessment Authority
VEGPSP	Values Education Good Practice Schools Project
WCCD	World Commission on Culture and Development
WCED	World Commission on Environment and Development
WCEFA	World Conference on Education for All
WPHRE	World Programme for Human Rights Education
WSSD	World Summit on Sustainable Development
WVS	World Values Survey
WWF	World Wildlife Fund

PREFACE

I have chosen to preface this work with an explanation of the personal relevance of the subject matter, and a description of the global context, circumstances and timely opportunities that shaped the specific choice of values-based Education for Sustainable Development (ESD) as the topic of study.

The emergence of Education for Sustainable Development (ESD) has a long history of over 40 years, as it evolved from Environmental Education (EE). The integration of socio-cultural and socio-economic factors with environmental ones coincided with the development of my own integrated understandings of the interdependent and systemic nature of how societies function in relationship with each other and with their environments. The progressive evolution of ESD is evident in the reports and proceedings of international conferences held over the past 40 years, as the international community progressively acknowledged the inextricable links between social, cultural and economic aspects of development and environmental sustainability. The growth of my personal understanding is evident in the life and work experiences that have shaped my values and thinking during the same period.

The family circumstances into which I was born and the schooling to which I was exposed, led to a lifelong investigative journey, and a desire to contribute to society through the medium of education. My family migrated to Australia in 1950 as refugees, having been dispossessed of their Istrian home in northern Italy, which was conceded to Yugoslavia after World War II. Since I was born in Adelaide shortly after my family left the refugee camp at Bonegilla in Victoria, I grew up with stories of two World Wars, poverty, hunger, loss and human indignity, while witnessing the family's struggle with a foreign language and culture. By the age of eight, being bilingual and bicultural, I was also fascinated by Indigenous cultures, had a love of animals and nature, and a keen desire to understand the diversity of life. At school I learnt about the United Nations (UN) in Social Studies from the Sisters of Mercy who worked on African 'missions', and who taught me about 'man's inhumanity to man' and the importance of contributing to society, by fundraising for Oxfam, World Vision and later, an international anti-landmine campaign, championed by the school Principal, Patricia Pak Poy. I remember clearly the image of the UN flags in my Grade 5 Social Studies textbook, representing a naïve child's hope that countries could work alongside each other for peace and human dignity, so important

to my family. By the age of ten years, I had already been exposed, both at home and at school, to some of the social and cultural aspects of sustainable development discussed in this study, that were to dominate my life for decades to come.

My schooling had a profound influence on my values and interests that was to last a lifetime, against a family backdrop of daily expressions of gratitude for this '*paradiso*' that had delivered the family from desperation to peace, well-being and opportunity. From these experiences, I learned the power of family and schooling on the shaping of values towards responsibility, contribution, respect and appreciation, and in particular the valuing of peace, human rights and dignity. It was the 1960s and environmental education had not yet been introduced in schools, but by 1971 when I began the study of languages at Flinders University in South Australia, spurred by a passion for cultural and linguistic maintenance, I was exposed to some of the classics of the environmental movement during exploratory visits to the campus bookshop. These opened the door to a new way of seeing the world, and a nascent interest in environmentalism.

From my first visit to Flinders University, I was puzzled by the spatial chasm that existed between the buildings allocated to Humanities and Social Sciences, and those across the lake on the other side of the campus dedicated to the Natural Sciences. I soon discovered that this divide was not merely a physical one, but one that pervaded all aspects of academic and eventually working life, policy development and Government. I became aware of a similar divide some years later when asked on my entry to politics, whether my political focus was social or economic, I replied that I did not perceive them as being separate. The distinctions between the natural and social sciences, and between social and economic issues, did not make sense to me then, nor do they now. Since my view did not appear to be shared by my contemporaries, it was with delight that I later discovered the multi-dimensional international organisation Unesco, which brings together uniquely Education, the Sciences, Culture and Communications. Equally inspiring was the later discovery of an affiliated network called Unesco-APNIEVE, which fostered cross-disciplinary values-based approaches to education for peace, human rights, democracy and sustainable development, that are directly relevant to this study.

Despite my values-based upbringing, I had not been exposed to a range of diverse perspectives nor had I had the opportunity to develop critical thinking or problem solving skills that would have prepared me for university and working life. I had instead absorbed everything that had

been presented to me as if it were truth within a relatively narrow worldview, without developing the critical literacy for inquiring, comparing, questioning and formulating my own informed views, which I now understand are key aspects of Education for Sustainable Development (ESD). The university environment in the early 1970s confronted this 17 year-old school leaver with an array of confusing messages and radical anti-establishment slogans that conflicted with her sheltered and conservative Catholic migrant background. These new ideas challenged a wide range of social, political, environmental and economic issues including nuclear proliferation, the Vietnam War, uranium mining, and gender roles, to name just a few. I found out that anti-war protesters were not 'bad' people to stay away from; an understandable message from a family who had previously feared the retaliation of a fascist regime; but that the protesters were expressing their democratic right to rail against military massacres and to call for peace. This today finds a familiar echo among environmentalists, peace activists and anti-globalisation demonstrators, whose forms of protest may differ, nonetheless the search for truth, justice and peace remain. The clear links between the past and present beg the question why the study of History fails to include learning lessons from past histories, to be applied in contemporary contexts.

In the 1970s, I participated in university and festival theatrical productions and musicals that expressed socio-political and environmental themes, and like many university students of the time, eventually developed a critical consciousness that was further to shape my values, friendships, vocational choices, and political beliefs. Yet, my secondary and tertiary education had not prepared me for the reality of life beyond institutional walls. To my chagrin, I discovered with my first casual job during a university vacation, that I had not acquired any practical work skills such as operating a simple adding machine, nor had I developed adequate socio-emotional skills to deal effectively with personal and work relationships and conflicts. This brought home the importance of life skills and the development of the whole learner, including functional skills and practical applications in education beyond theoretical and factual learning, discussed in Chapters 10 to 13 in relation to the Australian National Curriculum.

On completion of my studies, I joined a small team of teachers in 1976 to pilot bilingual and multicultural education for the first time in South Australian schools in order to: (a) raise cultural awareness among Australian children; (b) maintain migrant languages and cultures, and (c) foster cultural and linguistic diversity. I was unaware how ground breaking that work would be, while at the same time the children of boat people from Vietnam were welcomed to our

classrooms. These experiences introduced me to the importance of strengthening and maintaining cultural and linguistic heritage and identity, for dignity, self-esteem and educational achievement, and the role of respect and intercultural understanding for social harmony, which I now know are integral to ESD for a sustainable society. I also witnessed first-hand an enlightened approach to the compassionate settlement of Vietnamese refugees, based on the recommendations of the 1978 Galbally Report, in stark contrast with both my family's experience in Bonegilla in 1950, and contemporary practices for the detention of asylum seekers. I eventually left the field of multicultural education, returning 20 years later to contribute to the development of the multicultural cross-curriculum perspective in the South Australian Curriculum Standards and Accountability Framework (SACSA); an experience that informs my analysis of the cross-curriculum approach to sustainability in the Australian National Curriculum in this current study.

During the intervening 20-year period, I worked with traditional Indigenous peoples on the Pitjantjatjara Lands, and with fringe and urban Indigenous communities across South Australia in a range of educational roles. These experiences exposed me to new perspectives, a diverse cosmology and relationship with the land, and reflections on power, dominance and the impacts of colonisation and dispossession that were far more profound than my family had experienced. When consulting Indigenous communities about their educational needs in efforts to support self-empowerment and self-determination, I was shocked by living standards that could equate with those among the poorest developing nations, and by the cultural insensitivities of ill-prepared public officials. This led me subsequently to assist the Australian Public Service Commission in developing cross-cultural awareness programs for public servants working with migrants and Indigenous peoples.

This period of my life was truly revealing, for which neither my schooling nor university study had prepared me, challenging yet again my worldview and underpinning assumptions. In addition to learning to value Indigenous knowledge and different ways of knowing, understanding and perceiving the world, I gained unique insights into the integrated ways in which communities function, involving a complex, multilayered and interconnected web of socio-cultural, economic, and political reasons for why they might not function well. Although my role was an educational one, I could not separate the design of Indigenous community education programs from the deeply disturbing socio-cultural, socio-economic, environmental and health issues that beset community members. This experience helped me gradually to

assemble the disconnected pieces of a puzzle in my mind, to understand the multidimensional and interdependent functioning of human societies, later understood as sustainable development, when my education had prepared me only to understand separate elements. This is discussed again in later chapters with reference to the integration of knowledge in the Australian National Curriculum.

After having extended my understanding of immediate family experiences to include those of other migrant and Indigenous communities within Australia, I then extended my knowledge further afield to include international concerns. My global awareness expanded when working for Australia's Agency for International Development (AusAID), and subsequently teaching at a British International school in the Middle East, and later as a member of the Australian National Commission for Unesco, and founding President of Unesco-APNIEVE (Asia Pacific Network of International Education and Values Education) in Australia. The AusAID and Unesco experiences, further developed my understanding of the interconnected nature of human societies and cultures, not only within societies and countries, but also between them at the global level.

From the mid-1990s I became involved in human rights issues, firstly advocating for an Australian Bill of Rights during the Constitutional debates leading up to the failed referendum for an Australian Republic, and later as a member of the National Human Rights Education Committee, and later still when working in Multicultural Affairs in relation to the treatment of refugees in detention centres. During this time also, I became active in facilitating interfaith dialogue and understanding among Christian, Muslim and Jewish communities in South Australia, following the burning of mosques in reaction to the events of September 11 in 2001. These experiences extended my sphere of interest beyond cultural and linguistic sustainability and intercultural awareness, to interfaith understanding for societal peace, and broader human rights, equity and social justice aspects of sustainability. This period also saw the honing of my experience in educational and social policy development in Government advisory roles and in developing government-wide policies of access, equity, and social inclusion further deepening my understanding of social justice issues.

A decade-long involvement with Unesco introduced me to the world of international diplomacy, and the processes for developing international agreements, norms and standards. I spent hundreds of hours listening to the speeches of country representatives at Unesco biennial General Conferences and at over 50 international education meetings and conferences convened

by Unesco in various parts of the world, during which the texts of agreements were debated and agreed upon. I was involved in contributing to the Universal Declaration on Cultural Diversity and the development of the World Programme for Human Rights Education in 2004. During this time, I was exposed to a wide array of international and UN standard-setting documents, and began inevitably to compare the values and underpinning principles expressed in these documents with Australian educational policy and curriculum documents, with which I was familiar, noting and reflecting upon the similarities and differences, sometimes speaking and writing on the subject. From this experience, I drew inspiration for extracting the values, knowledge, skills and processes for Education for Sustainable Development from key international documents, eventually comparing them with their application in the Australian National Curriculum discussed in this study.

A defining personal moment, linking the past with the present, occurred the first time I entered the plenary hall at the start of the 31st session of the Unesco General Conference in 2001. The intense emotion generated by the sight of the national flags of Unesco member states lined up beside each other, recalled the spirit of the ten year-old whose childhood aspirations for a peaceful, just and harmonious world remained strong in the heart of the adult, despite the passage of time and some disillusionment. The child's vision had initiated a journey from an initial exploration of languages and cultures, to understanding the complex multidimensional interdependencies of society, culture, and environment at local, national and global levels, to inform a comprehensive approach to ESD.

As if to complete the journey of integrated understanding, my current role enables me to contribute to the implementation of the 2009 Council of Australian Governments (COAG) Green Skills Agreement for integrating skills for sustainability in tertiary education and training in Australia, thereby applying in practice a long personal interest in the environment, and satisfying my need to take positive action for mitigating climate change.

It was over 20 years ago immediately following the first Gulf War, that I experienced an intense desire to contribute positively to society through education, to address the serious socio-cultural, socio-economic, and environmental issues of the time, in ways that might not yet have been implemented. At the time, there was conflict in the Middle East, drought, civil war and famine in Somalia, increasing global poverty, an economic recession, emerging racism with the Mabo land rights decision and rising anti-immigration sentiments in Australia, and concern about sea and air

pollution caused by burning oil fields in the Persian Gulf. This scenario applies equally today, only greater concerns may be added, such as climate change, increasing natural disasters, the re-emergence and spread of tropical diseases, increasing rates of crime, terrorism, corruption, depression, substance abuse, suicide, and a general erosion of community values, notwithstanding the many scientific and technological advances that also occurred during this period to improve living standards for some. In the meantime, war continues in the Middle East.

Following many years of personal reading and reflection in the 1990s and beyond, I chose to investigate values in education, since the acquisition of knowledge and skills, although essential, had alone proved insufficient for bringing about positive societal change to address these concerns. Further inquiry discussed in this study, revealed that values can provide the motivation and impetus to take action for bringing about positive change; the missing link in education. This accorded with my personal experience that had shown me the importance of values especially if accompanied by critical thinking to avoid blind adherence to values imposed by others, and by appropriate skill and knowledge development for taking appropriate practical and informed action. The significant questions to address in relation to the topic were: (a) which values to teach; (b) to what end; and (c) how best to teach them, addressed in this study.

The period of my doctoral candidature fortuitously coincided with three separate events, which shaped the specific topic chosen for investigation, namely: (a) the establishment of the first National Framework for Values Education in Australia in 2004; (b) the 2002 UN proclamation of the Decade of Education for Sustainable Development (ESD) for the period 2005–2014; and (c) the Australian Government decision to introduce the first National Curriculum for schooling in 2009, with sustainability as a cross-curriculum priority, at a time when the issue of Climate Change was looming large on the political agenda.

These three factors not only meshed perfectly with my personal aspirations for a more peaceful, just and sustainable world, they also gave the study both purpose and topical relevance. The scene was set for me to explore the values, knowledge and skills that could form the basis of Education for Sustainable Development (ESD), to enable the transformations needed for peace, human rights, democracy and sustainable development. The developing Australian National Curriculum provided the ideal vehicle against which to test the findings of my investigation, and to satisfy a need for making a personally meaningful contribution to education not only in Australia, but across the Asia-Pacific region and the wider World.

CHAPTER 1:   LIVING AND LEARNING IN A RUNAWAY WORLD[1]

Introduction

Never in recorded history has the fate of humanity depended on the actions of human beings as it does today. Over the past few decades, the world has undergone unprecedented rapid change in almost every area of human activity and interaction, bringing new opportunities and emerging challenges. Indeed, more change has occurred by human hand in the last century than in millennia. For millions of years, the natural, evolutionary processes of nature that carved out the geographic features of the planet and led to the immense diversity of plant and animal life, including humans and their socio-cultural structures, are seemingly overtaken by the scientific, technological and informational capacities of the human mind. While there is cause for celebration in human achievement, the speed and scale of change demand cautious deliberation, as humanity struggles to come to terms with the unanticipated and perilous consequences of progress, and the rapidly expanding population of the World.

In times of change, society has always looked to education to develop the knowledge, skills and values needed to address contemporary challenges, and to create the kind of society and lifestyle appropriate to the time, place and context. This has been particularly so in times of crisis, transition and rapid change such as those encountered today. Dewey and others adapted Plato's view that it was first necessary to know the desired 'end' purpose of existence, and the type of society needed, for education to be designed accordingly:

> Unless we know the end, the good, we shall have no criterion for rationally deciding what the possibilities are which should be promoted. (Dewey, 1916, p. 88)

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[1] Title adapted from Giddens, A. 2000. *Runaway World*. London: Routledge.

A strong international consensus has emerged around "the end" that is universally desired for "the good" of all, and what is required of education to respond to current circumstances in all areas of life, socio-cultural, socio-political, socio-economic and environmental, consistent with globally shared values. The term most commonly used to describe this is **'Education for Sustainable Development'** (ESD) that is discussed in Chapter 2. This study examines the interdependent nature of contemporary challenges, and the ways in which values-based Education for Sustainable Development (ESD) may respond in practice for the development of a peaceful, just and sustainable world, at a time of great global change.

There is considerable evidence of both the benefits and threats of progress in all fields of human endeavour. For example, advances in medicine and technology have brought relief and well-being to the quality of life of millions, having eased suffering, cured and alleviated disease, reduced infant mortality, increased life expectancy, and provided fresh water, electricity and education to many parts of the world, but have also led to a population explosion. Recent developments in science and bio-genetics have the potential to improve health and well-being further still, but these also exacerbate population growth and give rise to new threats, inequalities and attendant ethical dilemmas.

The advances in communication technologies and transport have accelerated social and economic globalisation and interdependence, spread democratic ideals, extended human rights, and multiplied opportunities for intercultural and knowledge exchange exponentially, bringing people from the remotest parts of the world into closer proximity with others than ever before. Yet some aspects of progress have also brought unexpected effects, such as a growing digital divide, loss of linguistic and cultural diversity furthering cultural standardisation, and rising social, racial and religious conflicts that threaten human security.

Economic globalisation has provided wealth to many, but poverty to many more, creating both winners and losers, leading to enormous wealth on the one hand, and extreme poverty and inequality on the other, both within and between countries. The spread of democracy has brought freedom and opportunities for civic participation never seen before on such a large scale, but has been accompanied by the growth of a 'runaway' global market economy dominated by large trans-national institutions, many of which exceeded the wealth and power of most nations.

Despite global efforts, the persistent problems of over-population, poverty, illiteracy, hunger, disease, and inequity remained of concern throughout the world, and in many places had worsened (UNDP, 2007, p. 2). Layered over these were new challenges, such as increasing violence and terrorism, growing numbers of refugees seeking asylum, severe environmental degradation, climate change, biodiversity loss, increasing natural disasters, famine, and the threat of pandemic from which no-one was immune. Giddens called this "manufactured risk", with which there was little experience, since this was the first time in history that humanity had become concerned about what it had done to nature (Giddens, 2000).

The panoply of global problems currently experienced spans all dimensions of human life - socio- cultural, political, economic and environmental - interwoven in a complex web of interdependencies in ways that are impossible for experts and leaders alone to solve. International cooperation and interdisciplinary exchange are crucial if humanity is to succeed in solving the challenges that threaten the very continuation of life on Earth, requiring education to prepare future leaders and researchers in cross-disciplinary engagement. It is increasingly difficult to shut out problems by strengthening border controls - a modern version of the walled fortifications of the past. The reach of globalisation, electronic communication, climate change and other global concerns transcend national boundaries, making protectionist efforts futile and

cooperation essential. In this context it is imperative that education foster the requisite global values to achieve such cooperation and exchange.

With such tremendous intellectual and technological firepower, humankind has the capacity either to create universal well-being or to continue damaging what nature has taken millions of years to create, and to provoke conflict over ideologies or resources, while some enjoy excess and others suffer deprivation. Future scenarios can be shaped by what is valued and considered most important, whether it be: (a) individual accumulation of wealth, or collective human well-being; (b) proving one ideology over another, or respecting diverse world views; and (c) the glory of winning and prevailing over others, or harmonious unity with nature and with others, while protecting ecological and cultural diversity. The Nobel laureate economist Amartya Sen argued that shared norms and social values underpinned the kind of life that everyone would want, and that freedom and democratic processes provided the context within which shared values could be negotiated through dialogue (Sen, 1999a). Such shared values, when agreed globally, as they are in international agreements and conventions, may form the basis for living together equitably, harmoniously and sustainably on Earth, reinforced through education.

Yet it seems that the qualities of the human heart, such as values, compassion and connection with nature, have been unable to keep pace with the human mind and its capacity for technological and scientific progress. These are evident in all areas of life including education. Western emphasis on reason and logic that began with Plato and Aristotle, was championed by Descartes in the seventeenth century and continued by Kant in the eighteenth century, although spawning immense scientific progress, might have led circuitously to a deficit of values today. As a result of increasing urbanisation and the commercial production of food on a large scale, humanity has also experienced a disconnection from the natural world upon which it has always

depended for identity and survival. Society seems to have forgotten that humans are not separate from nature, instead they are an intimate part of natural ecosystems characterised by a delicately balanced interdependence of flora, fauna and resources, sustained by natural water and carbon cycles that have taken millennia to evolve and just a few centuries to dismantle.

While the Western emphasis on reason led to immense technological and scientific progress, it was not balanced by the application of values, integral to the feeling, sensing, and intuitive side of human nature. The Nobel laureate and neural scientist Sperry pinpointed neglect of human values as the "primary underlying cause of most of our difficulties" (Sperry, 1983, p. 9). Saul also saw the "void in society" as being caused by the "absence of values" (Saul, 1993, p. 584). Recent developments in neural science and moral psychology had revealed the positive influences of perception, intuition and emotion on choice, values and priorities (Haidt and Joseph, 2004). Failing to nurture these in education can foster the development of individuals who base their decisions on reason alone, at a cost to society and to the environment. The neural scientist, Damasio (1994) demonstrated that the use of reason alone, unsupported by emotion, might cause even greater problems than faulty logic or irrationality. In the field of education, Hill claimed that, "technical values associated with economic rationalism were inadequate to keep the peace and maintain social structures", while arguing for a values education focus on social justice and shared community goals (Reynolds, 2001, p. 23). Einstein also lamented the erosion of ethical values, caused by an overemphasis on fact and intellect, with serious consequences for humanity (Einstein, 1951).

The power of ideas
The pervasive influence of Cartesian philosophy offers just one example of the profound impact that the books of great thinkers, philosophers, scientists and educators have had on human

endeavour, some positive, others not. Armstrong's substantial analysis of texts dating back to the Axial Age almost three thousand years ago, revealed considerable similarity in emerging moral codes across Eastern, Western, Indian and Middle Eastern civilisations, suggesting that at least some human values, such as compassion for example, might be integral to human nature (Armstrong, 2006). Some neural scientists and psychologists were also of this view (Dawkins 1976, Pugh 1977, Sperry 1983, Pinker 2003). A rich source of human values that shaped thinking for millennia is contained within the ancient Indian *Vedas*, the Confucian *Analects*, Aristotelian *Ethics*, Buddha's *Kanjur*, the Babylonian *Talmud,* and later the Christian *Bible,* and the Íslamic *Qur'an*. Armstrong also found that these texts emerged, for the most part, at times of great social change (Armstrong, 2006), not unlike the profound socio-cultural, but also climatic-environmental changes experienced today on a much larger and broader scale.

It has only been during the past few centuries that prevailing ideas have shifted, at least in the West, leading to dramatic changes in the ways people live, work and relate to nature. We are therefore at a turning point in history, ready for the emergence of new values and the renewal of old ones, transmitted through education and communication technologies. An investigation in this study, of the thinking of educators and philosophers across time and cultures, reveals that the development and transmission of values have always been part of the aims of education, particularly in times of great change. With the current accelerating rate of change in an interdependent world, the many issues demanding attention and cooperation locally and globally, require education to foster values-based thinking and inspirational ideas in learners that can motivate them to take positive, competent and informed action.

A study of past societies revealed that values were reinforced strongly in times of rapid change and turmoil. Given the widespread changes of significant magnitude that occurred over the past

50 years, and the lifestyle transformations likely in the decades to come necessitated by climate change, the strengthening of values is sure to be needed once again, shaped by current circumstances. In order to facilitate this period of transition, Armstrong suggested that the ideas of the past should be revisited, to "adapt the original insights … to the needs and circumstances of today" (Armstrong, 2006, p. xvii). Sperry also recommended the adoption of values suited to the needs of the times:

> The obvious recommendation is to shape up our value systems to something more in tune with present-day reality, more properly suited to the new powers that man now commands and the new problems we now face. (Sperry, 1983, p. 10)

It helps to know where humanity has been, but also to have a compass for guiding preferred directions for the future. As with the texts of ancient times in the past, the great books of modern times influence thinking across all dimensions of human life and fields of study today. They help in the search for potential solutions to present and future realities, but also raise key questions that stimulate thinking and beg inquiry.

In the **natural** dimension of life, Darwin's treatise *On the Origin of Species* (Darwin, 1859), while controversial both then and now, since it challenged religious tenets of creationist origins of the Earth, nonetheless provided the foundations for evolutionary biology through the theory of natural selection and adaptation, and revealed the inherited origins of diversity through natural processes. This diversity is now threatened by human hand. In recent times there have been attempts made to remove the study of evolution from the subject of Biology in American schools, and even in Australia, by creationists who have attributed evolution to intelligent design rather than to natural processes. This trend is disturbing since it gives credence to sectarian belief and ideology, not to be confused with values, rather than to Science. As history has shown, ideological clashes cause bitter conflict, but Science has the potential to free human-kind from the yoke of ideology, balanced by ethics and shared values for a better world for all. An over-

emphasis on reason does not warrant a reactive descent into ideology and irrationality. Agreed and shared values towards collective well-being have the potential to create a pivotal point of balance between reason and illogic, reinforced by an education system that harmonises cognitive with physical and socio-emotional development, and which clearly distinguishes between values, beliefs and knowledge.

Neural scientists, biologists, psychologists and moral philosophers alike share an interest in evolutionary biology in seeking to resolve the contentious nature-nurture debate, and the extent to which moral sense is inherent, imprinted genetically, or socialised. Recent discoveries relating to neural plasticity have clearly indicated that both nature and socialisation play their part (Doidge, 2007), with implications for values-based childrearing and education.

In the realm of science, Watson's discovery of the structure of DNA, described in his autobiographical account *The Double Helix* (Watson, 1968), led to a proliferation of genetic research and discoveries culminating in the mapping of the entire human genome in 2000. The discovery was hailed an historic landmark achievement, and "the most wondrous map ever produced by humankind" (BBC, 2000). This powerful knowledge of the key to human creation, previously accorded to an omnipotent God alone, while bringing enormous benefit, compels scientists to question the ethical considerations and possible species-polluting consequences of unchecked human interference in natural evolutionary processes. The risks and potential consequences of the genetic manipulation of plant, animal and human genomes, if allowed to escape laboratory confines, can exceed the capacity of the most learned scientists to control. Runaway genetic change can alter the path of evolution forever, the consequences of which are entirely unknown. The United Nations (UN) system establishes international standard-setting documents for addressing such risks, such as the *Universal Declaration on the Human Genome*

and Human Rights (Unesco, 1999a), and the *Universal Declaration on Bioethics and Human Rights* (Unesco, 2006), replete with inspiring value-laden phrases, and informed by existing human rights conventions. Nowhere is the need for a rigorous application of values and ethics more evident than in the field of genetic science and research, which has already found its way into school and university curricula, necessitating the integration of values in its educational approach.

The **economic** dimension of society is also in need of values to balance the rampant economic rationalism, over-production and consumerism, that have dominated the wasteful 'throw-away' culture for so long with dire consequences for so many. Aristotle referred to the **economy** as the "wise government of the family" (Horne, 1992, p. 23), but today economists have strayed far from this view of the family of humanity, obsessed with continuous growth, profit and productivity at all costs in a market motivated by greed (Horne, 1992, pp. 8-9). Saul referred to the "ethical slide" of the market, and a "marginalization of ethics" paralleled by an intense rise in corruption (Saul, 2006, pp. 184-185). Hamilton maintained that economics relied solely on the "validity of rationality to the exclusion of all else" (Hamilton, 1994, p. 160), leading to a lack of consideration for human well-being and environmental integrity. Although a strong and stable economy can bring material well-being and access to health, education, an enjoyable life, and other benefits, economic production is fed from natural environmental resources, without which economic activity would falter. Alternative and sustainable economic systems are needed that can deliver universal well-being, while preserving the resources and natural systems upon which humanity depends. This cannot occur while the existing economic paradigm remains unchallenged and unchecked by global values, despite its repeated failure to deliver equitable benefits to the majority.

Free market ideologies that had promised to deliver prosperity, have instead led to widespread economic depression twice in 80 years, causing poverty, hardship and loss for many, and an unstable global market economy that threatens to fail once again. Hawken claimed that while ecologists were concerned with nature, and economists were concerned with economics, "human beings are abandoned to the marketplace" (Hawken, 1993, p. 131), unmitigated by a global values framework that would maintain a sense of justice, fairness and order. History showed that economic disparity, exclusion and injustice inevitably led to social conflict. Hence, it would be wise to observe the call of Voltaire to make the "dominant passion … the public weal" (Saul, 1993, p. 6). Hawken called for an economy directed to creating "the best life for the greatest number of people" (Hawken, 1993, p. 205). In the same vein, Sperry called for a commitment to progress in terms of "improvement in the quality and dimensions of life" for all (Sperry, 1983, p. 23).

In his seminal work *Development as Freedom* (Sen, 1999a), Sen interconnected economic with social and political freedoms as the path to universal well-being, and highlighted the important role of education and democracy in achieving this. Sen explored the cross-dimensional aspects of development and advocated the expansion of individual and collective freedoms, (political, social, protective and economic), as both the primary end and principal means of development. Sen maintained that these alleviated human deprivation and oppression, and provided choice and opportunity, thereby maximising human capacity to act as agents of positive change (Sen, 1999a, pp. 36-38). He argued that the traditional focus on economic and technological development and markets as the **means** for human advancement had alone been unsuccessful in delivering equitable or humane outcomes, whereas the expansion of freedoms as an overarching objective "directs attention to the ends (i.e. human well-being) that make development important" (Sen, 1999a, p. 3). This view of development as needing to be human-centred rather than

economically-centred, is also advocated by the UN, which regularly calls for the humanising of development, and "globalization with a human face" (UNDP, 1999).

In the **socio-political** and **educational** dimensions of life, Connell considered Dewey's 1916 treatise, *Democracy and Education*, the most important educational text of the twentieth century (Connell, 1980, p. 72). Dewey conducted a critical analysis of contemporary theories of knowing and moral development, which were to influence educators for over 80 years. He proposed an "intimate organic connection" between the acquisition of knowledge, everyday life experiences, both inside and outside school, and educational methods and materials, with character development, moral growth and conduct (Dewey, 1916, p. 360). Dewey connected learning with participation in everyday life, involving realisations about values through experiencing rather than merely by theoretical learning, socialisation, or routine habit formation.

Dewey proposed that education in a democracy was ideally to be orderly and sequenced, forming a developmental social process that enabled free communication, equal and informed participation, contributing towards societal change and well-being, and leading to the continued capacity for learning and growth throughout life (Dewey, 1916). Education was not to be limited to the classroom, nor crammed into 12 brief years, but to extend to the whole school community and throughout life as part of everyday events, experiences and interactions that were immediately relevant and emotionally charged, thereby ensuring their retention in memory. From the work of Dewey, Sen, and numerous relevant UN documents, it may be concluded that education in a free and open democratic society, which promotes shared values for societal well-being, may assist greatly in addressing socio-economic injustice, in resolving conflict, and in restoring balance with the natural world.

While democracy has adopted various forms and levels throughout the world, it is generally associated with individual and collective civic participation, rights, liberties and freedom of speech, in varying degrees. According to Giddens (2000), democracy was "the most powerful energising idea of the twentieth century", having more than doubled in the number of countries that adopted democracy throughout the world since the mid-1970s. Some countries had to struggle and fight for democracy, while others experienced transition problems or reversals, and in the oppressive regimes of others human rights were frequently abused (Giddens, 2000). However, Saul recalled that long-standing democracies in the West themselves also "emerged slowly out of highly imperfect conditions" (Saul, 2006, p. 203). Democratic values and principles are therefore to be nurtured and reinforced constantly through education to maintain their original intent in practice.

Australia inherited its democratic system from Britain without having to fight for it, hence many freedoms are now taken for granted. More is expected of democracy and a sense of disillusionment with democratic process is growing, accompanied by a loss of trust in politicians who are perceived as self-interested and corrupt. Giddens explained this trend as occurring in open information societies that produced "more active, reflexive citizenries" in a "detraditionalising world", and to counter it would require a deepening and broadening of democracy at the global level (Giddens, 2000). This would require education to promote democratic principles and values, such as 'participation' and 'open dialogue', reflected also in its content, methods and processes.

Although considerable attention has been given to authoritative texts in the sciences, socio-politics, economics, and education, this has not been the case in the field of **ecology** until recently. Early warnings were expressed in the environmental classics, such as: Marsh's *Man*

and Nature (1864); Carson's *Under the Sea-Wind* (1941), *The Sea Around Us* (1951) and *Silent Spring* (1962), which helped trigger the beginnings of the environmental movement; Commoner's *The Closing Circle* (1971); and *The Limits to Growth* report to The Club of Rome (Meadows, Randers and Behrens, 1972), which predicted that economic growth could not continue indefinitely because of the limited availability of natural resources. Yet only committed environmentalists responded to these until the United Nations (UN) organisation initiated a series of influential international conferences and reports that captured public attention.

Gore's book and documentary film of the same title, *An Inconvenient Truth* (Gore, 2006), highlighted the shocking impact of human activity on climate, which for the first time reached a global audience of millions. The predictions of social and economic collapse, foreseen in *The Limits to Growth* report (1972) appeared to be unfolding. The Intergovernmental Panel on Climate Change (IPCC, 2007), in its fourth assessment report, *Climate Change 2007*, gave evidence of melting glaciers, rising seas, changing weather and temperature patterns, inundation, transforming landscapes, extreme events, reduced rainfall, drought, and water and food insecurity, among other findings, as a result of human-induced warming. Because of the level of controversy surrounding climate change, the Royal Society published *Climate Change: A Summary of the Science* (Pethica, 2010), and the Australian Academy of Science published *The Science of Climate Change: Questions and Answers* (AAS, 2010), which may challenge the sceptics who sought to delay action on climate change for at least two decades. Although some nations are gradually developing national policies and strategies to address climate change, the level of international cooperation leaves much to be done, since political, economic and corporate interests continue to dominate concerns.

The contribution of the United Nations

Arguably the system best able to foster the level of international cooperation needed to address the significant challenges faced by humanity, is the United Nations (UN), with almost universal representation among nations. The founders of the UN left a structural legacy after World War II that today enables open international debate and agreements in many fields, based upon principles drawn from the UN founding documents, such as the 1945 *UN Charter* and the 1948 *Universal Declaration of Human Rights* (UDHR). Since its very beginnings the UN has fostered global dialogue, exchange and cooperation towards common goals based on shared values, directed to the equitable advancement of humanity in all areas of life. Collective aspirations for a peaceful, just and sustainable world have been expressed in the numerous international conventions and agreements to which UN member countries are signatories. This study analyses the global values most commonly expressed in relevant documents as a basis for applying to Education for Sustainable Development (ESD) in concert with local values.

For decades the UN has convened international conferences that addressed a wide range of socio-economic and environmental concerns, beginning with the 1972 Stockholm Conference on the Human Environment, followed later by the 1987 Brundtland World Commission on Environment and Development (WCED), and more recently the UN Climate Change conferences held in Copenhagen in 2009, in Cancun in 2010, and in Durban in 2011, to name a few. The UN also declared the period 2005 to 2014 the UN Decade of Education for Sustainable Development (DESD), with the goal of integrating the principles, values, and practices of sustainable development into all aspects of education and learning. The DESD aimed to foster changes in behaviour towards a more sustainable future, in the areas of the environment, the economy and society, in ways appropriate to local cultural contexts. This decade coincided with the International Decade for a Culture of Peace and Non-violence for the Children of the World

(2001-2010), the International Year of Planet Earth Triennium (2007-2009), and the UN Decade for Human Rights Education (1995-2004), which led to the establishment of the World Programme for Human Rights Education (WPHRE), providing a concentrated international focus on the type of education needed for a peaceful, just and sustainable world.

By conducting a content analysis of these and other relevant international documents, this investigation demonstrates that what is needed at this time is an integrated, values-based approach to Education for Sustainable Development (ESD), that develops the whole learner (i.e. cognitive, physical, emotional, social, moral and spiritual). This study focuses particularly on the development of values for ESD since values are very much needed at this time and have been somewhat neglected in education when compared to the acquisition of knowledge and skills. Nonetheless, the key features of a quality approach to ESD are also examined, including the knowledge, and cognitive and functional skills needed for transforming thinking, lifestyles and work practices, tested against the Australian National Curriculum.

Even though pedagogy is not a key focus in this study, the need for a conducive learning environment and positive relationships are emphasised, as are democratic processes of teaching and learning to foster responsible civic participation, and informed ethical action for bringing about positive societal change. Education has a special role to play in facilitating the transformation needed, to shift from an individualist and materialist consumer society, to one that embraces both individual and collective needs for a sustainable future, while preserving the environment and enabling well-being for all.

This study addresses the subject from a global perspective applied to the Australian context, since no country can isolate itself from global concerns in an interdependent and globalised

world, and learners today need to be prepared to become global citizens. Although this inquiry applies the features, principles and values for ESD to schooling, these are equally adaptable to all levels of education and training.

The key agency in the UN system with responsibility for education and for international exchange in education, the sciences, culture and communications, is the United Nations Educational, Scientific and Cultural Organization (Unesco). Unesco is also the leading agency for implementing the UN Decade of Education for Sustainable Development (2005-2014), which promotes an integrated approach to education for sustainability based on values, bringing together all interconnected dimensions of sustainability (i.e. socio-cultural, environmental and economic). This study draws on the 2004 draft International Implementation Scheme for the Decade (IIS) as the guiding document to inform the development of key characteristics of Education for Sustainable Development (ESD), needed to address global challenges for a sustainable world.

Since its establishment, Unesco has published numerous influential books and documents relevant to this study, promoting values-based solutions to socio-cultural, economic and environmental issues, for attaining equity, peace, human rights and well-being for all. Among these was de Cuéllar's 1995 Report of the World Commission on Culture and Development (WCCD), *Our Creative Diversity*, which reformulated the concept of development with a **socio-cultural** focus, in terms of human well-being rather than economic progress alone. The report proposed alternative models for development that preserved cultural heritage and diversity based on a global ethic of shared values. The report was significant since it directed sustainability towards maintaining economic viability, protecting environmental integrity and diversity,

sustaining social cohesion, and preserving cultural and linguistic diversity; an aspect of sustainability that has often not been recognised.

The field in which Unesco has been most influential is undoubtedly **Education**, both internationally and in Australia. Two of the most influential international reports on education to emerge from Unesco were: (a) Faure's 1972 Report of the International Commission on the Development of Education, *Learning to Be: The world of education today and tomorrow*, which proposed whole-person lifelong learning for "democracy, humanistic development and change" for redressing the imbalanced "relationship between man and his environment" (Faure, 1972, p. 101); and (b) the Delors 1996 Report of the International Commission on Education for the Twenty-first Century, *Learning: The Treasure Within*, which also highlighted the need for whole learner development through values-based education (Delors, 1996, p. 94). This study analyses the findings of these two leading education reports and other relevant Unesco publications.

In writing about Unesco's purpose and philosophy after its founding in 1946, Unesco's then Director-General Mayor cited Huxley, who argued that values must consciously guide the work of the organisation:

> Unesco cannot be neutral in the face of competing values … any … system (of values) which is unconsciously assumed is less likely to be true than one which is consciously sought after and studied. (Mayor, 1995, p. 79)

This study argues for the conscious and explicit choice of global values in education for a sustainable world, without which: (a) market-based and media-imposed values may continue to dominate without regard to human well-being or environmental concerns; (b) scientists and bio-geneticists may continue their developmental research untempered by ethical or environmental considerations; and (c) the homogenising impact of communication technologies may reduce the

world's rich and diverse tapestry of cultures and languages to a handful that hold economic and technological sway.

A founding and active member of Unesco, Australia is a young nation that has not experienced war within its borders, located on an island continent in the southernmost part of the globe, seemingly sheltered from global vicissitude. Nonetheless, the reality of global interdependence has now reached its shores. The inter-related issues of climate change, environmental degradation, the global financial crisis (GFC), growing intercultural and inter-religious conflict in a multicultural society, increasing pressures from asylum seekers, the constant threat of terrorism, and growing social concerns and inequities internally, present education in Australia with many complex challenges and competing priorities. A consistent national approach to education for a sustainable society across the Australian States and Territories is required to address these challenges.

Towards a National School Curriculum

There has been a tradition of innovation in education in Australia dating back to the mid-1960s when the first ideas for a National School Curriculum were being explored by educational pioneers ahead of their time. Although the six separate colonies had formed a national Federation of States in 1901, the Australian States and Territories retained legislative control over public education and the school curriculum, as they do today, making consensus difficult (Reid, 2005, p. 15). The only effective national forums for professional exchange in the 1960s and early 1970s were the education conferences organised under the auspices of the Australian National Advisory Committee for Unesco, since official curriculum cooperation was difficult. It was not until 1973 when the Commonwealth Schools Commission was established, followed by the Curriculum Development Centre (CDC) in 1974, that national cooperation in education

officially began (Keeves, 1999, pp. 120-121). There were repeated attempts at establishing a national curriculum by several Federal Education Ministers, beginning with Fraser in 1968 with the Australian Science Education Project (ASEP), Dawkins between 1988 and 1993, and by Nelson in 2003. Efforts were also made by Skilbeck from the CDC in 1980, and by the Curriculum Corporation with the production of national learning materials from 1997. But it was not until mid-2010 that the first national curriculum documents were officially released for implementation. After a journey of more than 40 years, the Australian National School Curriculum had finally arrived. It had been helped along the way by the first statement of the National Goals for Schooling in 1989, which was revised in 1999 and again in 2008, and by the development of the Core Curriculum for Australian Schools by the Curriculum Development Centre (CDC) in 1980, and the mapping of the Mathematics Curriculum across all States and Territories in 1988, followed by Science and Technology (Keeves, 1999, p. 122).

Until very recently values and moral reasoning were not explicitly evident in Australian school curricula or in the various learning domains, except for a sub-area of personal development (Keeves, 1999, p. 122), since education was for a long time considered to be either values-free or values-neutral (Keown, 2005, p. 1). The Values Education Study commissioned by the Australian Government in 2003 found that schools were not values-free and that formal and hidden curricula were in fact based on values (DEST, 2003). The Australian Government then established the National Framework for Values Education in Australian Schools (NFVE), conducting trials in selected Australian schools and documenting case studies of good practice, leading to quality criteria for values education. This work provided the foundation for the systematic integration of values in Australian schooling.

Although the development and integration of values in education can trigger the necessary personal and societal changes of attitude, and provide the intrinsic motivation to adopt sustainable lifestyles, values alone are insufficient to create the extent of transformation required for a sustainable society. A paradigm shift is needed that includes values, but that also alters systems of thinking, by critically examining underlying assumptions, challenging old habits, and developing a systemic global consciousness that understands the interconnections between the local and the global. Trans-disciplinary and transformative learning are vital for enabling critical systems thinkers to find innovative, ethical solutions to complex, inter-related and multi-dimensional problems from diverse perspectives, and with equitable outcomes.

Given the urgency of current problems that threaten our socio-cultural, environmental and economic systems, learners and educators need not only to undergo a personal transformation of values and systems of thinking, but also need to understand the holistic processes of personal and societal transformation, which engage the whole person. By understanding personal change processes, learners acquire the tools to develop themselves continually throughout life, and by understanding social change processes, are empowered to become agents of change in their school, community and work place. In addition to acquiring values, and transforming thinking, learners therefore need also to develop the functional skills to apply knowledge and values in practice for collective benefit.

Conclusion

From an extended text analysis of international documents and relevant literature, this policy-oriented study examines the concepts of Education for Sustainable Development (ESD) and values in education, and considers how values may best be taught and learned for a sustainable future. Downey (1965) claimed that schools operate in three ways; by what they teach, by how

they teach and by the kind of place the school is. These three areas are investigated to propose a coherent approach to values-based ESD, built upon a comprehensive review of scholarly writing and international documents that set the standards required. In addition to the values, skills and knowledge for ESD, the quality features of ESD are advanced to form of a set of evaluative criteria, tested against the developing Australian National Curriculum as a case study; the first Australian curriculum deliberately to include 'sustainability' as a cross-curriculum priority (Commonwealth of Australia, 2010, p. 5).

The purpose of this study is to emphasise the need for education at all levels to enable learners to become responsible and ethical global citizens, equipped to contribute to the societal transformation needed for sustainable human development. Such an education would ideally be based on the shared global values derived from the UN system that can foster a peaceful, just and sustainable world. Since international consensus has already been reached regarding the nature of education needed to respond to current circumstances, termed Education for Sustainable Development (ESD), this study therefore begins with the background to ESD and the International Scheme (IIS) proposed for its global implementation, hereafter referred to respectively as ESD and the IIS.

CHAPTER 2:   EDUCATION FOR SUSTAINABLE DEVELOPMENT

Introduction

This chapter introduces the origins and evolution of Education for Sustainable Development (ESD) from Environmental Education (EE) over a period of 40 years, up to the establishment of the draft *International Implementation Scheme for the UN Decade of Education for Sustainable Development* (IIS) (Unesco IIS, 2004). The IIS outlined the values, knowledge, skills and quality features of ESD to be integrated in educational curricula and is one of the key documents informing this study. An analysis of the IIS draws out the values, knowledge, skills, key characteristics and multiple interconnected dimensions of ESD, as well as the other key United Nations (UN) initiatives linked to ESD. These are examined and elaborated further in subsequent chapters to develop a comprehensive and coherent set of values, knowledge, skills and criteria for developing and evaluating school curricula for a sustainable society.

What is Education for Sustainable Development (ESD)?

It is necessary first to define what is meant by the terms 'sustainability', 'development', 'sustainable development' and 'Education for Sustainable Development' (ESD) that are often used in discussion, and to be aware that different terms are used to refer to ESD in Australia that have implications for education.

The evolving concept of sustainable development

The use of the term '**sustainability**' has become more frequent since World War II (Holdren, Daily, Ehrlich, 1995, p. 1), referring to a process, state, or condition that can be maintained indefinitely (IUCN 1991), that originally related to the natural environment. Numerous

definitions of sustainability have emphasised the maintenance of the **environment**, without

reference to socio-cultural, economic or developmental considerations, for example:

> … maintenance of essential ecological processes and life-support systems; preservation
> of genetic diversity; and sustainable utilization of species and resources. (IUCN, 1980)

> … the maintenance of the total natural capital stock at or above the current level.
> (Costanza, 1991)

> … use of an organism, ecosystem, or other renewable resource at a rate within its
> capacity for renewal. (IUCN, 1991)

An interdependent approach to conservation that harmonised environmental conservation with

development was sought for the first time by *The World Conservation Strategy* (IUCN, 1980).

The meaning of 'sustainability' shifted and became more widely known after it was associated

with the term '**development**' in the 1987 *Report to the World Commission on Environment and*

Development (WCED) chaired by Brundtland, which acknowledged the need to "balance

economic and social progress with concern for the environment and the stewardship of natural

resources" (Unesco IIS, 2004, p. 11). The often-quoted Brundtland definition of **'sustainable**

development' as "development that meets the needs of the present without compromising the

ability of future generations to meet their own needs" (1987, p. 43), represented the first formal

recognition that development, progress and growth needed to take account of their

environmental impacts. The Brundtland Report acknowledged that 'sustainable development'

involved a number of interconnected systems (i.e. economic, political, social, productive,

ecological, technological and administrative), and emphasised the need to address both **peace**

and long-term environmental challenges for sustainable development:

> the strategy for sustainable development aims to promote harmony among human beings
> and between humanity and nature. (Brundtland, 1987, p. 43)

The term **'sustainable development'** later included **social justice** considerations. After the 1987

WCED report, the term **'sustainability'** became ambiguous as it was applied to many fields and

used to mean different things by various interest groups. Sustainability to an economist or a business owner might refer to economic viability, while to an environmentalist, the preservation of an ecosystem, and to a sociologist, the maintenance of culture and language. The term **'development'** was also interpreted differently according to context and interests, for some meaning 'economic growth', and for others referring to 'human progress and well-being'. But the term **'sustainable development'**, as defined in many international documents, referred to human well-being and quality of life while maintaining environmental integrity, facilitated by economic and technological development, as shown in the following examples:

> Economic growth that provides fairness and opportunity for all the world's people … without further destroying the world's finite natural resources and carrying capacity. (Pronk and Haq, 1992)

> Sustainable development is essentially about relationships between people, and between people and their environment. (Unesco IIS, 2004, p. 14)

The World Conservation Union 1991 definition of 'sustainable development' was different from, but complementary to, that in the Brundtland Report, with the notion of **improving** rather than merely **maintaining** quality of life:

> Improving the quality of human life while living within the carrying capacity of supporting ecosystems. (IUCN 1991, p. 10)

When considered together, the two definitions conveyed the intention for sustainable development to benefit **both** people and natural systems.

The UN Development Programme (UNDP) has been measuring and reporting global progress against a Human Development Index (HDI) since the first Human Development Report (HDR) in 1990, in which the objective of development was defined in terms of human well-being. The oft-interpreted meaning of development only in economic terms was questioned in the HDR, which saw economic development as a **means** to human well-being and not an **end** in itself:

The expansion of output and wealth is only a means. The end of development must be human well-being. (UNDP, 1990, p. 10)

The UN Millennium Development Goals (MDGs), established in 2000 and reviewed in 2010, established ambitious targets for human development to be achieved by 2015 for ending poverty and hunger, combating HIV/AIDS, promoting universal education, gender equality, child and maternal health and sustainable development (UN, 2000). If there is to be any hope of meeting these targets, education at all levels must respond immediately. The MDGs provided "an over-arching framework for development and cooperation" that did not focus on economic growth to 'alleviate ills', but on the **end** goals of development.

Much of the sensitivity around definitions and use of terminology reflected concerns that sustainable development might mean the end of growth, but this would depend on the subject of growth, and whether social and environmental consequences were taken into account in achieving it. Holdren defined 'development' as:

progress toward alleviating the main ills that undermine human well-being … by altering the driving forces … in ways that do not compromise the capacity to maintain the improved conditions indefinitely. (Holdren, 1995, p. 1)

In Holdren's view, 'sustainable development' involved ensuring that the "choice of processes and end states for development are compatible with maintaining the improved conditions indefinitely", so that growth would be compatible with sustainability of the improved conditions, provided all 'ills' were addressed. Since all aspects of human well-being were interdependent, "failure to address any one of them can eventually undermine the progress made on all the others" (Holdren, 1995, p. 1). The importance placed by Holdren on "**choice** of processes and end states for development" highlighted the role that **values** played in shaping decisions and action impacting on society and environment, since choices were inevitably based on values.

In the decades following WCED, the links between human and ecological needs were strengthened in defining 'sustainable development', which subsequently broadened to inter-relate social, environmental and economic aspects of sustainability, and eventually cultural ones. This was affirmed firstly by the 1992 UN Conference on Environment and Development (UNCED), which clearly acknowledged the interconnectedness of the three domains of sustainable development; nature, economy and society; and again by the 2002 World Summit on Sustainable Development (WSSD), which integrated concerns of poverty, equity, social justice, human rights and quality of life issues into sustainable development (UN, 2002a). Since the WSSD, the cultural context in which development occurred has been recognised as an essential underlying factor shaping sustainable development according to local cultural concerns.

The former Director-General of Unesco, Matsuura, included moral, scientific and political perspectives in his definition of sustainable development, reflecting the interdependent and values-based nature of ESD:

> Sustainable development is a moral precept as well as a scientific concept. It is closely linked to peace, human rights and equity as much as to ecology or global warming. And it obviously concerns the natural sciences, economics and politics. It is also a cultural issue. Founded on the values … it implies that we recognize the complex interdependence of human needs and the natural environment. (Unesco SD, 2005, p. 1)

Thus, the concept of **'sustainable development'** evolved over several decades to include environmental and cultural factors, including social justice, quality of life and socio-economic issues. A synthesis of the continually developing definition of 'sustainable development', gleaned from the international documents mentioned above (i.e. WCED, WSSD, IIS), reveals that it includes:

  (a)   living within nature's limits and resources;

  (b)   equitable economic participation, and distribution of resources, wealth and opportunities;

  (c)   human health, well-being, quality of life, equality, rights and freedoms;

(d)   interdependence between economy, society, culture and the environment;

(e)   full and equal, civic and democratic participation and expression;

(f)   peace and harmony among diverse cultures and faiths, both within and among nations; and

(g)   the preservation of cultural, linguistic and biological diversity.

It is important to understand the breadth and interconnected nature of sustainable development since it shapes the choice of knowledge, skills, values and structure of educational curricula for ESD.

The UN Decade of Education for Sustainable Development (DESD)

The idea of dedicating a UN Decade to Education for Sustainable Development (DESD) was first proposed at the 1992 UN Conference on Environment and Development (UNCED) to signal that "education and learning lie at the heart of approaches to sustainable development" (Unesco IIS, 2004, p. 7). UNCED recommended the re-orienting of education "to foster values and attitudes of respect for the environment" in education (Unesco IIS, 2004, p. 7). The 2002 World Summit on Sustainable Development (WSSD) held in Johannesburg, affirmed the interdependence and mutually reinforcing nature of the dimensions of sustainable development (social, environmental and economic), and also recommended a decade for ESD.

That year the UN General Assembly proclaimed the Decade of Education for Sustainable Development (DESD) for the period 2005–2014 and designated Unesco the leading agency responsible for its implementation (UN, 2002b), in recognition that "education is an indispensable element for achieving sustainable development" (Unesco, IIS, p. 7). In 2004, Unesco published the draft International Implementation Scheme (IIS) to guide UN member

states in the development of their national action plans for implementing the decade to reorient their education systems to sustainability, which is the key document referenced in this study.

The International Implementation Scheme (IIS) described the nature of ESD and reinforced the interconnected spheres of society, environment and economy, but "with culture as an underlying dimension" and the context in which sustainable development occurred (Unesco IIS, 2004, p. 4). The IIS described ESD as incorporating concepts of quality education to foster the "values, behaviour and lifestyles required for a sustainable future and for positive societal transformation" (Unesco IIS, 2004, p. 4). This study investigates the nature of the values, knowledge, skills and quality features of ESD, needed for learners to change their personal lifestyles and take action for transforming society positively for sustainable development.

An often-used working definition for ESD, upon which this study is based, is:

> Education that allows learners to acquire the skills, capacities, values and knowledge required to ensure sustainable behaviour and lifestyles, inspired by creative and critical thinking, in order to encourage the resolution and management of problems that stand in the way of sustainable development. (Unesco SD, 2005, p. 9)

Nonetheless, the dynamic concept of ESD continues to evolve, as national and global issues emerge, new priorities are emphasised, and further research is conducted into quality educational processes.

Clarifying terms used to describe ESD

In Australia, the term **'Education for Sustainability'** (EfS) is widely used, instead of Education for Sustainable Development (ESD), predominantly with an environmental rather than a socio-cultural or socio-economic emphasis. Another term used is **'Education for a Sustainable Future'** (ESF) with a futures focus, which also emphasises the environment. As in other

countries, EfS emerged from Environmental Education (EE), which had been taught in Australian schools since the 1970s. This environmental focus is still reflected in existing approaches to EfS, despite rhetoric that EfS "includes the built environment and social and economic considerations as well as the natural environment" (Commonwealth of Australia, 2010, p. 5).

The persistent omission of the term 'development' from Education for Sustainability (EfS) in Australia inevitably raises questions about the reasons for it. Those who interpret 'development' to mean 'economic growth' may consider it contradictory to align growth with sustainability. Others who consider 'development' in the context of aid and development, may consider it to apply only to developing countries and not to an already developed nation such as Australia. There may be reluctance to link sustainability with development since this would involve accounting for the social and environmental consequences of economic growth, with impacts on industry. The most likely explanation might be that the term 'Education for Sustainability' (EfS) was already in use before the term 'Education for Sustainable Development' (ESD) became internationally accepted. Whatever the reason, the consequences of its omission may lead to a general lack of awareness of broader social and human development issues in Australia.

The term 'EfS', shapes perceptions about its meaning, since most educators in Australia are likely to consider sustainability in environmental terms after several decades of exposure to Environmental Education (EE). Amending the term to include 'development' can mark a significant shift to integrate socio-cultural and socio-economic issues holistically with environmental concerns in education. Despite the difference in terminology, some documents had described EfS as including "more complex social issues, such as the links between environmental quality, human equality, human rights and peace" (Henderson and Tilbury, 2004,

p. 8). This study examines the extent to which such stated intentions are translated in practice in the Australian National Curriculum.

Many terms were used interchangeably during the 1997 International Conference on Environment and Society (ICES), to refer to the comprehensive concept of ESD, such as Education for Sustainability (EfS), education for sustainable living, education for environment and sustainability, Education for Sustainable Development (ESD), and education for a sustainable future (ESF) (Unesco ICES, 1997), but 'ESD' later became the widely accepted term internationally. This study uses the term 'Education for Sustainable Development' (ESD) in view of the international agreement on ESD, and after considering Australia's demonstrated commitment to the UN Decade for ESD by holding a national launch in 2005, developing a national strategy for its implementation (DEH, 2007), and submitting periodic progress reports to Unesco regarding ESD implementation. In order to understand more clearly how education may contribute to the development of a sustainable society, it is necessary first to discuss the background to the emergence of ESD from Environmental Education (EE), and to identify the characteristics of ESD that were expressed in the IIS.

The evolution of Education for Sustainable Development (ESD)

Early ideas around the concept of 'environmental sustainability' first began to emerge in education in the late 1960s, with the birth of Environmental Education (EE). Since then, the term 'sustainability' has expanded considerably in meaning to include notions of sustainable development, initially with only an environmental and economic focus, but later to include socio-cultural considerations.

ESD also evolved from a narrow definition of Environmental Education (EE) eventually to encompass a convergence of inter-related issues and concerns across all dimensions of life. According to Sato, EE was first formalised in 1970 at a meeting of the International Union for the Conservation of Nature and Natural Resources (IUCN) in Nevada, where the definition included 'values' and the 'cultural' context:

> a process of recognising values and classifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture and his biophysical surroundings. (Sato, 2006, p. 1)

EE continued to develop in the 1970s and 1980s with concerns about the Earth's capacity to sustain growing patterns of consumption and production, and their effects on the natural environment in terms of pollution and depletion of resources. The first UN Conference on the Human Environment (UNCHE) held in Stockholm in 1972, recommended that the International Environmental Education Programme (IEEP) should be established to develop EE for promoting understanding through education in managing, protecting and improving the environment (UNCHE, 1973). While UNCHE focused attention on environmental concerns, it also stimulated exploration of the inter-relationships between the environment and socio-economic issues of poverty and underdevelopment. From this grew an understanding of the need to balance social and economic progress with environmental stewardship.

The 1977 Inter-Governmental Conference on Environmental Education held in Tbilisi described the aim of EE as promoting understanding of:

> … the complex nature of the natural and built environments resulting from the interaction of their biological, physical, social, economic and cultural aspects, and (to) acquire the knowledge, values, attitudes and practical skills to participate in a responsible and effective way in anticipating and solving environmental problems. (Unesco-UNEP, 1978)

The inter-relatedness of the multiple dimensions of sustainable development reflected in this statement, and the integration of knowledge, values, attitudes and practical skills for

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participation, problem solving and action, were also reflected in the IIS. This supported Sato's view that EE had indeed provided the building blocks for the evolution of ESD (Sato, 2006). But EE was to anticipate and solve only environmental problems rather than finding systemic solutions to socio-political, cultural, environmental and economic concerns.

The IUCN 1991 publication *Caring for the Earth,* emphasised the importance of EE for changing behaviour necessary for sustainable development to improve "quality of life within the carrying capacity of supporting ecosystems" (IUCN, 1991, p. 10). The following year, the UN Conference on Environment and Development (UNCED) outlined the Global Action Plan for Sustainable Development in Agenda 21, which highlighted the critical importance of fostering values and attitudes of respect for the environment through education to improve individual capacity for addressing environment and development issues (UN, 1992). These references were based upon the principles laid down at the 1977 Tbilisi conference, further substantiating Sato's proposition that ESD evolved from EE (Sato, 2006).

Agenda 21 led to the establishment of the Environment, Population and Information for Human Development (EPD) project in 1993, which included the social, environmental and economic considerations of population change, intertwined with issues of poverty, equity and human dignity, quality of life, and global environmental protection. Agenda 21 became a catalyst for action for sustainable development throughout the world, including the development of *The Earth Charter Initiative* in 2000, which outlined a set of values and principles for a sustainable future for educational purposes, to build a "just, sustainable, and peaceful global society for the 21st century" (ECI, 2000).

The 1997 International Conference on Environment and Society (ICES), *Education and Public Awareness for Sustainability*, led to the adoption of the Declaration of Thessaloniki, which described sustainability as a **moral** and **ethical** imperative, encompassing not only the environment but also poverty, population, health, food security, democracy, human rights, peace, cultural diversity, and traditional and Indigenous knowledge (Unesco ICES, 1997, p. 2). The Declaration of Thessaloniki also acknowledged that an **interdisciplinary** approach to ESD was needed, which "brings together the different disciplines" (Unesco ICES, 1997, p. 2), later picked up in the IIS.

Although ESD ultimately evolved from the foundation work provided by EE, the IIS clearly distinguished between EE, which focused on the relationship between humans and the natural environment and on preserving and caring for natural resources, and ESD, which encompassed EE set within "the broader context of socio-cultural factors and the socio-political issues of equity, poverty, democracy and quality of life" (Unesco IIS, 2004, p. 16).

With the gradual implementation of ESD, the thinking around how best to teach it in practice continues to develop and evolve as educators share their experiences internationally. Sterling, a leading British thinker with significant influence on a 'whole-school approach' to Education for Sustainability (EfS) in Australia, made a useful distinction between: (a) environmental education or education **about** sustainability, a first order change focused only on knowledge and content relating to the "learning of ecology" that maintained the existing paradigm; and (b) education **for** sustainability, a second order change forming an adaptive or reformative response, which nonetheless included values and critical thinking; and (c) education **as** sustainability, a third order change that included the previous two approaches and also engaged the whole person and the whole school community in systems thinking, for an "ecology of learning". Sterling

considered this approach to be transformative and creative, in line with the international vision of ESD cited earlier (Sterling, 2001, pp. 60-61).

It is this third approach that is advocated and fleshed out in this study, which Sterling called 'sustainable education', requiring transformative change in educational thinking and practice (i.e. education as the **subject** of change), in order to effect the transformative change needed for a sustainable society (i.e. education as **agent** of change) (Sterling, 2003, p. 22).

Implementing the UN Decade of Education for Sustainable Development

The draft International Implementation Scheme (IIS) outlined a broad framework for implementing the UN Decade of Education for Sustainable Development (2005-2014), which included the following key action areas: (a) integrating sustainable development in education content, pedagogy and methods adapted to local contexts; and (b) re-orienting education programs at all levels to the principles and values of sustainable development, emphasising values, and inter-disciplinary and transformative approaches (Unesco IIS, 2004). Although not intended to be fixed or comprehensive, the IIS outlined some of the values, skills, knowledge and characteristics of ESD, which are summarised in the Appendixes 1, 2, 28 and 33 and elaborated upon in subsequent chapters.

In 2005, Unesco commissioned the development of the *Guidelines and Recommendations for Re-orienting Teacher Education to Address Sustainability*, to support teacher educators and policy makers in implementing ESD, which included criteria for ESD to be: (a) lifelong, engaging all levels and types of education; (b) locally relevant and culturally appropriate; (c) based on local needs while recognising global effects and consequences; (d) inclusive of environment, society, and economy; (e) flexible and adaptable to accommodate the evolving

nature of sustainability; and (f) to address content, context, pedagogy, global issues, and local

priorities (Unesco, 2005a, p. 16).

Similar descriptions of ESD exist in various relevant international and Australian documents,

each emphasising some aspects of ESD over others depending on local priorities, which are

discussed, elaborated upon and synthesised throughout this investigation, progressively

developing a comprehensive set of evaluative criteria for ESD, against which the Australian

National Curriculum is tested.

Values-based Education for Sustainable Development

The IIS clearly emphasised the importance of values, stating that ESD was:

> … fundamentally about values, with respect at the centre: respect for others, including
> those of present and future generations, for difference and diversity, for the environment,
> for the resources of the planet we inhabit. (Unesco IIS, 2004, p. 4)

The IIS called for the integration of the values for sustainable development into all aspects of

learning to foster the "values, behaviour and lifestyles required for a sustainable future",

requiring the processes of teaching and learning to "model the values of sustainable development

itself" (Unesco IIS, 2004, pp. 15-16). This supported the view of McGettrick (1995), Halstead

and Taylor (1996), Yero (2002), Hill (2004) and Lovat and Toomey (2007), who emphasised the

importance of teachers as role models, and schools providing a conducive learning environment

in which positive values were demonstrated in action in all areas of school life.

ESD was to be 'values-driven' and the "assumed norms" and "shared values and principles"

underpinning sustainable development were to be "made explicit so that they can be examined,

debated, tested and applied" (Unesco IIS, 2004, p. 16). ESD therefore involved values being

made explicit in the learning context, reflected in institutional practices and teacher behaviour,

the curriculum, resources and teaching methods. Such a whole school ethos of sustainability

enables both institutional and personal transformation of behaviours and lifestyles for teachers

and students, and inspires action for change towards sustainability in the home, community and

workplace.

An education of quality based on values was also called for by the IIS, and by the World

Programme for Human Rights Education (WPHRE), which specifically addressed the social

dimension of sustainability:

> A rights-based quality education encompasses the concept of education for
> sustainable development (involving) … wider ethical issues such as human values and
> human rights … to strengthen 'our engagement in support of other values - especially
> justice and fairness - and the awareness that we share a common destiny with others'.
> (OHCHR, 2006, p. 16)

There were over 20 values for ESD identified within the IIS, with the most prominent being

'respect' (Unesco IIS, 2004). The mid-term review of the effectiveness of ESD implementation

was conducted in 2010, and four additional values for ESD were included in Unesco's strategy

for the second half of the DESD (Unesco, 2010). The values drawn from both documents are

listed in Appendix 1, collated alongside the global values expressed in other international

documents relevant to ESD, which are discussed at length in Chapter 6.

Multiple interconnected dimensions of Education for Sustainable Development

The IIS repeatedly emphasised the comprehensive and interdependent nature of ESD, referring

to its "multiple connections and societal depth" (Unesco IIS, 2004, p. 6), touching upon "all

aspects of the social and institutional fabric" (Unesco IIS, p. 10), including issues such as:

"poverty, unequal distribution of resources, population growth, migration, malnutrition, health

and HIV/AIDS, climate change, energy supply, ecosystems, biological diversity, water, food

security, and environmental toxins" (Unesco IIS, 2004, p. 8). These issues are reflected in the

four dimensions of ESD, namely, **society**, **environment** and **economy**, interconnected by the underlying dimension of **culture** (Unesco IIS, 2004, p. 4), which are described here.

Social

The social dimension of ESD involved an understanding of the role of social institutions in: (a) change and development, (b) democratic systems for full participation, (c) the selection of governments, (d) the forging of consensus, (e) the resolution of differences, and (f) transparent governance (Unesco IIS, 2004, p. 12 and p. 18), thus incorporating civic and political perspectives. The IIS also connected social with cultural issues to include social justice and human rights, peace and security, gender equality, cultural diversity and intercultural understanding, and health and HIV/AIDS (Unesco IIS, 2004, pp. 17-18).

Environmental

The environmental dimension of ESD, involved awareness of the limited resources and fragility of the environment and the impacts of human activity, and the inclusion of environmental concerns in social and economic policy development (Unesco IIS, 2004, p. 12). It also entailed protecting and restoring the world's ecosystems, natural resources and bio-diversity, mitigating and preventing further climate change by reducing carbon emissions, disaster preparation, risk reduction and mitigation, promoting sustainable urbanisation, and restoring rural environments (Unesco IIS, 2004, p. 18-19).

Economic

The economic dimension of ESD involved minimising adverse impacts of economic growth on society and the environment, and monitoring personal and societal levels of production and consumption (Unesco IIS, 2004, p. 12). It also involved reducing poverty, more equitable distribution of income and equal employment opportunity, regulating the market for socio-

economic justice and environmental protection, and greater corporate responsibility and accountability (Unesco IIS, 2004, pp. 18-19).

Cultural

The cultural dimension provided the context in which ESD was implemented, and the foundation through which the other three areas, society, environment and economy, interconnected for sustainable development (Unesco IIS, 2004, p. 13). Culture was described in the IIS as the "values, diversity, knowledge, languages and worldviews" that influenced how ESD was addressed in each context (Unesco IIS, 2004, p. 4), shaping its directions and priorities.

Cultural perspectives in ESD involved: (a) recognising cultural and linguistic diversity; (b) respect and tolerance of difference; (c) acknowledging values in open debate and dialogue; (d) modelling values of respect and dignity; (e) building human capacity in all aspects of sustainable development; (f) local indigenous knowledge of flora, fauna and water access; (g) fostering sustainable agricultural practices and preventing excessive rural exodus; (h) acknowledging culturally specific views of nature, society and the world; (i) the use and development of local languages in communication thereby reinforcing cultural identity; and (j) fostering cultural industries and tourism while respecting culture, values and identity (Unesco IIS, 2004, p. 13).

Shaeffer defined the four dimensions of ESD in terms of the Unesco pillar of 'learning to live together' (Delors, 1996) peacefully, equitably, humanely and sustainably, which he claimed lay at the very heart of ESD. He linked the cultural perspective of ESD with "living better together to promote international and inter-faith and intercultural understanding, and to preserve cultural and linguistic diversity" (Shaeffer, 2007a, pp. 3-4). The scope of the four ESD dimensions are listed in Appendix 3, acknowledging that they are interconnected and therefore needing to be

taught in integrated ways, rather than as separate bodies of knowledge. These provide the basis
for further elaboration of ESD content in subsequent chapters.

Links between the UN Decade for ESD and other UN initiatives

Owing to the broad scope of ESD and the multiple connections between its various dimensions,
there are numerous links between ESD and other UN initiatives. The IIS connected the
implementation of ESD to other coinciding international initiatives, such as the UN Millennium
Development Goals (MDGs), the goals of Education For All (EFA), and the UN Literacy
Decade (UNLD, 2003-2012), since these formed part of the broader context within which ESD
was to be implemented (Unesco IIS, 2004, pp. 9-10). ESD was to complement these initiatives in
relation to, for example, achieving universal literacy and quality education, human rights and
gender equality, democracy and active citizenship, and reducing poverty.

The IIS stated that these initiatives worked together in that: (a) the MDGs provided the
development goals to which education contributed; (b) the EFA focused on providing quality
educational opportunities for everyone; (c) the UNLD promoted the use of literacy as "the key
learning tool for all forms of structured learning"; and (d) ESD promoted a "set of underlying
values, relational processes and behavioural outcomes which should characterise learning"
(Unesco IIS, 2004, p. 10). Since these initiatives all shared the promotion of human rights
through values-based education (Unesco, 2005b), and given that various related UN initiatives
coincided, such as the International Decade for a Culture of Peace and Non-violence for the
Children of the World (2001-2010), and the World Programme for Human Rights Education
(WPHRE), also with Unesco as the leading agency, it makes sense also to examine the
documents relating to these, in exploring a values-based, quality approach to ESD.

The WPHRE considered that a "rights-based quality education encompasses the concept of education for sustainable development" and acknowledged the synergies among coinciding international initiatives, "coupling efforts to address issues of common concern" (OHCHR, 2006, pp. 16-17). The WPHRE also referred to links with a number of international documents such as, the Universal Declaration of Human Rights (UDHR), the 1990 Convention on the Rights of the Child, the Integrated Framework of Action on Education for Peace, Human Rights and Democracy (Unesco, 1995), Education For All (EFA), the Millennium Development Goals (MDGs), and the UN Literacy Decade (OHCHR, 2006).

These and other documents are analysed in this study, to identify the most commonly expressed global values for ESD, and the shared characteristics of quality education. There are similarities and strong relationships among them, involving the principles and values underpinning ESD, peace, and human rights that guide the nature of quality education and inform the implementation of ESD. The intense international focus on fostering peace, human rights and sustainability through quality education for all, offers a unique opportunity for education not to be missed in the development of a National Curriculum in Australia.

Convergence of values-based educational areas towards ESD

The multidimensional and interconnected nature of ESD necessitates an integrated approach to learning. Currently the multiple ESD dimensions are scattered across a range of educational topics with a values base, such as: global education, peace education, environmental education (EE), development education, anti-racism education, futures education, civics and citizenship education, multicultural education, indigenous studies, values education, education for international understanding (EIU), human rights education (HRE), moral education, life skills, health, nutrition and HIV/AIDS education, inter-faith and inter-cultural education, and world

heritage education, among others (Shaeffer, 2007a, p. 4). The evolution of ESD from EE coincided with a convergence of values-based educational areas, as systemic understandings emerged of the interdependence of socio-cultural, socio-political, environmental and economic issues. However, ESD does not negate the need to highlight separately each of these values-based educational areas according to local priorities.

Many of these values-based educational areas emerged gradually from the 1960s onwards, and from the global values in seminal UN documents such as the *UN Charter* and the *Universal Declaration of Human Rights* (UDHR). Hicks and Holden called these 'issues-based educations' (Hicks and Holden, 2000, p. 5), Hoepper called them 'adjectival educations' (Hoepper, 2002 p. 6), and Shaeffer called them 'values-based educations' (Shaeffer, 2007a, p. 4) that have both a local and a global focus to promote understanding.

They all shared the features of being: (a) human-centred; (b) focussed on global concerns with local applications; (c) underpinned by global values, thereby reinforcing global interdependence; and (d) having similar participative and student-centred methods. They were sometimes integrated in related learning areas such as Social Studies or Studies of Society and Environment (SOCE). Global Education particularly shared many similar features to ESD, since it was 'interdisciplinary', 'future-oriented', addressed "multiple interdependencies", and was "anticipatory, participative, person-centered, situational, based on the stimulation of thinking … focused on issues" (Georgescu, 1997, p. 4).

Many values-based educations also shared a focus on human rights, which provided the primary source of global values:

All efforts taking place in the school system towards peace education, citizenship and values education, multicultural education, global education or education for sustainable development do include human rights principles in their content and methodologies. (OHCHR, 2006)

The WPHRE advocated "a holistic approach to teaching and learning that reflects human rights values … integrated into all aspects of education" using methodologies that were "democratic and participatory" (OHCHR, 2006, pp. 6-7), echoing similar statements to those in the IIS.

Each values-based educational area developed independently, with some cross-disciplinary sharing, until the 1980s when debate about the relationships between them began to intensify. To a greater or lesser extent, each was concerned with global issues relating to peace, justice, equity, human rights, human health and well-being, development and sustainability, with socio-cultural, economic, political and, more recently, ecological perspectives. While each area had distinctive features and emphases, they were "parts of a greater whole", and there were dangers in "each field trying to achieve its goals without reference to the others" (Hicks, 2000, p. 6).

Discussions inevitably followed regarding which areas of values-based education should subsume others. In 1987, Greig, Pike and Selby "proposed that Global Education was the most apt term to embrace all of these approaches" (Hoepper, 2002, p. 6). In 1993, the declaration of the World Conference on Human Rights asserted that "human rights education should include peace, democracy, development and social justice" (UN, 1993, Art. 80). The World Programme for Human Rights Education (WPHRE) subsequently linked human rights education with peace, intercultural and interfaith understanding, a democratic and socially just society, and a humanistic view of sustainable development (OHCHR, 2006). In 2000 it was proposed that 'peace education' should become the "generic umbrella for the adjectival educations" (Hoepper, 2002, p. 6). In 2006, Shaeffer presented ESD "as a framework for - or an umbrella over - these

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various kinds of values-related curricula … because they all represent behaviours and values" that supported the various dimensions of sustainability (Shaeffer, 2007a, p. 5).

Following a proposal by the Asia Pacific Centre for Education for International Understanding (APCEIU) that Education for International Understanding (EIU) should be the umbrella term for education for peace, justice and sustainability, a series of information leaflets was published jointly with Unesco in 2007, to clarify confusion and to "highlight key complementary areas and synergies between the two areas" (i.e. EIU and ESD) (Unesco-APCEIU, 2007). The published leaflets made it clear that while the two areas overlapped and shared similar concerns, EIU emerged from the fields of peace education and intercultural understanding, while ESD emerged from the field of EE, both of which expanded to cover similar global issues:

> EIU and ESD are not dogmas but evolving concepts that can contribute to social learning and transformation. EIU and ESD share many common issues, supporting each other's scope of work and focus. (Unesco-APCEIU, 2007, p. 2)

The IIS described ESD as promoting the aims of development "alongside other over-arching concepts such as peace and human rights" (Unesco IIS, 2004, p. 10), and considered that "ESD must encompass and promote all areas of learning" (Unesco IIS, 2004, p. 15), since all the interconnected dimensions of sustainability were contained within ESD.

Given the origins of ESD in EE, it is not surprising that educators interpret ESD mostly in ecological terms. Global Education is the only area that does not emphasise one area over another while covering all ESD dimensions, but it is marginalised as an optional enrichment topic, and is discounted in the development of the Australian National Curriculum.

Over the past few decades, these values-based educations have influenced each other through intellectual exchange at international forums, and converged gradually towards the development

of ESD as "part of a wider movement" (Hicks, 2000, p. 6), while continuing to retain their own distinct but expanded identities. Each area in its own way, contributed to the development of the comprehensive and integrated, values-based approach to ESD advocated by the IIS.

Conclusion

This chapter provides the historical development and background context for ESD, and introduces some key ESD features that are consistently expressed in relevant international documents, but particularly in the ESD guiding document (IIS), as the basis for reorienting educational programs and curricula towards ESD. The ESD characteristics described in the IIS and listed in Appendix 2, are further elaborated in subsequent chapters to develop a comprehensive set of evaluative criteria for testing against the Australian National Curriculum.

The many complex, interdependent problems, and competing priorities confronting societies, present education with multiple challenges that are not easily solved by traditional methods of reform. The integration of values into education represents an important step in the process of change, but a paradigm shift in education is also needed to transform thinking, behaviour, lifestyles and work practices, beginning with educators and the education system itself.

CHAPTER 3: INVESTIGATING EDUCATION FOR SUSTAINABLE DEVELOPMENT

Introduction

This policy-oriented study examines how global challenges may be addressed effectively by adopting a values-based approach to Education for Sustainable Development (ESD) in schooling. It involves a content and text analysis of key international standard-setting documents, reports and relevant scholarly research, to identify the values, knowledge, skills and key characteristics of ESD that are consistently expressed. These are then synthesised to form a comprehensive and coherent framework of evaluative criteria for ESD, which are then used as the basis for analysing the first four learning areas of the Australian National Curriculum that were released at the time of writing. This framework of evaluative criteria may also be useful for developing educational curricula, and reorienting educational systems towards ESD as called for by the International Implementation Scheme for ESD (IIS). Although this study specifically addresses school curriculum development for ESD, with a specific emphasis on values, and less so on pedagogy and assessment, the ESD principles and evaluative criteria may be adapted for all levels of education.

This chapter consists of several parts, first to describe **what** the investigation involves, second to outline **how** it is conducted and reported in terms of the research methods used, and third to discuss the **strength** or validity of the findings and their theoretical underpinnings.

Description of the Investigation

Structure and outline

Overall this thesis is divided into three parts as described here.

Part 1

Chapters 1, 2, 4 and 5 provide the introduction and background essential to the investigation. In particular, Chapter 1 outlines key global concerns driving the need for values-based Education for Sustainable Development (ESD) and points to potential approaches for addressing them through education investigated in this study. Chapter 2 discusses the nature of ESD as described in the IIS, which continues to inform discussion throughout this study. Chapter 4 examines the nature of education across time, in particular the important role that values played in education, and clarifies definitions and understandings of values. Chapter 5 provides an overview of relatively recent initiatives in Australian schooling involving the integration of values, with particular relevance to ESD.

Part 2

Chapters 6, 7 and 8 investigate the global values, knowledge, skills and quality characteristics needed in schooling to foster a peaceful, just and sustainable world. Specifically, Chapter 6 identifies and describes the global values, while Chapter 7 discusses key quality characteristics of education appropriate for ESD, involving values-based learning environments, relationships and other features. Chapter 8 identifies and discusses the knowledge and skills needed for ESD, and summarises the quality characteristics of Education for Sustainable Development gleaned throughout this study to form a set of evaluative criteria used to evaluate the Australian National Curriculum in Part 3.

Part 3

Chapters 9 to 13 discuss the analysis of the first four learning areas of the Australian National Curriculum, based on the values, knowledge, skills and quality characteristics of ESD developed

in Part 2, against the background discussed in Part 1, including suggestions for enhancement that are summarised in the concluding Chapter 14.

Key documents

An in-depth content and text analysis is conducted of key international and Australian documents and reports relating directly to the implementation of ESD, and to features of quality education linked to ESD, to identify the values, knowledge, skills and key quality characteristics of ESD, which are synthesised into a set of evaluative criteria for analysing the Australian National Curriculum.

Some of the most significant international documents investigated are: (a) the IIS (Unesco IIS, 2004), which guides policy and practice for integrating ESD in national education systems; (b) the World Programme for Human Rights Education (OHCHR, 2006) and its source documents, the Universal Declaration of Human Rights (UN, 1948), and the Convention on the Rights of the Child (OHCHR, 1990); (c) the Dakar Framework for Action for Education For All (Unesco Dakar, 2000) and other documents relating to quality education; (d) the United Nations (UN) Millennium Development Goals (UN, 2000); (e) the Statement of the UN Literacy Decade (UNLD, 2002); and (f) the Earth Charter Initiative (ECI, 2000), among others that are listed in Appendix 17.

The key Australian documents examined include: (a) the *National Framework for Values Education in Australian Schools* (NFVE) (DEST, 2005); (b) *Environmental Education for a Sustainable Future*, (Commonwealth of Australia, 2000), and the updated document, *Living Sustainably*, the Australian Government's National Action Plan for Education for Sustainability (Commonwealth of Australia, 2009a); (c) The *Sustainability Curriculum Framework*, a guide for

curriculum developers and policy makers (Commonwealth of Australia, 2010); (d) *Educating for a Sustainable Future*, the National Environmental Education Statement for Australian Schools (DEH, 2005); and (e) the successive national goals for Australian schooling, in particular the *Melbourne Declaration on Educational Goals for Young Australians* (MCEECDYA, 2008), which informs the development of the Australian National Curriculum.

Values

In identifying the global **values** needed for ESD, a thorough text analysis is conducted of 22 international agreements and UN documents relevant to ESD, to identify the most commonly expressed values associated with socio-cultural, environmental and socio-economic dimensions of sustainable development. These global values are collated, analysed and grouped in 16 sets of related values, as a guide for education to address the implementation of ESD, while complementing local cultural and national values. The global values are then compared to commonly identified Australian values, and to those in the National Framework for Values Education (NFVE), in order to identify areas of similarity and difference between Australian and global values. The global values are also tested for their expression in the Australian National Curriculum to identify potential gaps or inconsistencies with the global values.

Knowledge and Skills

In identifying the **knowledge** needed for ESD, the issues relevant to all dimensions of sustainable development, consistently expressed in key international and Australian policy-oriented documents associated with ESD, are collated and grouped together to form a content framework to guide curriculum development for ESD. The content groupings identify the various areas of knowledge for learners to acquire during their school years as the basis for a sound understanding of interrelated sustainability issues, acknowledging that these may differ

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according to local geographic, cultural and socio-economic contexts. Although the sustainability issues to inform content are grouped separately, and divided into their social, cultural, environmental and economic components, they are closely interrelated, needing to be taught in an integrated way for systemic understandings.

Since only a systemic view of complex problems enables solutions to be found without causing negative consequences elsewhere in a system, corresponding skills also need to be acquired. **Skills** for ESD are therefore also drawn from the same documents from which the knowledge for ESD is identified, in order to develop a list of cognitive and functional skills for ESD. Although sustainability issues to inform curriculum content may vary from one context to another, and global values may also be promoted alongside local and cultural values, ESD skills are relatively consistent regardless of culture or location.

Characteristics and Evaluative Criteria

The key **characteristics** of a quality values-based approach to ESD are summarised, based on an examination of scholarly writing, and a text analysis of the key international and Australian policy documents mentioned earlier, to form a comprehensive framework of **evaluative criteria** for ESD.

A broad range of scholarly research relating to values education policy and practice is investigated, including quality educational processes appropriate for the teaching of values and sustainability. This also involves an examination of the research and case studies that were conducted in implementing the National Framework for Values Education (NFVE), in order to develop a set of quality principles underpinning good practice in values education, which may be applied to values-based approaches to ESD. Although the issue of pedagogy is not central to this

study, the research literature also informs the development of the evaluative criteria for ESD, which are then used as the basis for analysing the extent to which the national curriculum meets the requirements for ESD, recognising that Australian priorities might differ from international emphases.

Analysis of the Australian National Curriculum

Comprehensive content and text analyses are conducted of the first four learning areas developed for the Australian National Curriculum, compared against the values, knowledge, skills and quality characteristics of ESD, in order to discover the extent to which the developing curriculum serves the purpose of ESD, and whether sufficient attention is given to all dimensions of sustainability. This involves the tabulation of every value and skill expressed in the text of the curriculum documents for each of the four learning areas, English, History, Science and Mathematics, compared to those needed for ESD, as expressed in the relevant international and Australian documents.

A comparison is also made between relevant content in the curriculum and that recommended for ESD, acknowledging that some sustainability content is necessarily context specific. The comparisons permit the identification of strengths, weaknesses, gaps or shortfalls in the implementation of ESD in the curriculum, and lead to proposals for additional research and potential enhancements to the curriculum.

Methods used in conducting the investigation

The nature of this investigation does not purport to be "basic", "fundamental" or "conclusion-oriented" research intended to "extend the frontiers of knowledge", inform theory, or be of exclusive interest to the research community (Nisbet, 1999, p. 64). Instead, the research brings

together existing collective knowledge and experience in a unique way for the explicit purpose of informing education policy and practice on the emerging topical issue of ESD and for evaluating the implementation of ESD in the Australian National Curriculum.

The investigation therefore has an "instrumental" function in that it seeks "answers to relevant problems … which are of current concern … accepted as priority topics for research" (Nisbet, 1999, p. 64). Its audience comprises mainly educational decision makers and policy-writers, curriculum developers and implementers, teachers and student teachers, although educational research workers may also consider the findings to be of interest and importance.

Policy-oriented research

Research that is conducted for the express purpose of "direct application to current issues in educational policy or practice" is generally called 'policy-oriented' research (Nisbet, 1999, p. 65), which Nisbet defined as educational research that is:

> designed, managed, and reported with the specific purpose of informing a policy decision, or assisting or monitoring its implementation, or evaluating its effects … closely tied to educational practice as well as policy. (Nisbet, 1999, p. 64)

According to Nisbet, 'policy-oriented' research was "responsive" to a practical need or current concerns, with the "end products" being "recommendations for decision or action" (Nisbet, 1999, pp. 65-66). This study seeks to respond to current global concerns around socio-cultural, socio-economic and environmental sustainability, with recommended educational policy and curricular solutions that are most likely to lead to a sustainable society as the "end product". Nisbet also stated that responsive 'policy-oriented' research tended to operate "within the context of existing policy or practice", in this case, the existing collective experience of expert educators from around the world who have reached a consensus about the characteristics of education that are most likely to lead to sustainable development. Policy-oriented research

"modifies (and hopefully improves) the existing situation" identifying potential problems, challenging policy and practice, and developing or exploring alternatives (Nisbet, 1999, p. 66). The modifications implied or directly recommended in this study, in some cases may involve incremental change, but in others may lead to transformative shifts for example, in the way school curricula are conceived and structured to foster trans-disciplinary learning for systemic understandings. An analysis of the Australian National Curriculum seeks to identify both strengths and potential problem areas, and to challenge existing curriculum development practice to advance and examine alternative solutions for contributing to the development of a sustainable society.

This investigation represents an exemplar of policy-oriented research in two areas. First, it investigates and analyses international policy and standard-setting documents and Australian policy documents relevant to ESD. Second, a values-based framework of evaluative criteria for ESD is developed from those documents to inform and evaluate the extent to which national education policy, curricula and practices meet the ESD criteria. In this sense, the purpose and outcomes of the research are intended to be subsequently used both as a tool for developing ESD policy and curricula, and as a set of evaluative criteria against which to assess the implementation of ESD reflected in educational policy and curricula. The purpose of this study is to develop a framework to inform policy making, change practice and enhance curriculum development towards ESD, based on evidence.

Content and text analysis

The key method used to conduct this investigation is the comprehensive analysis of the content of international and Australian policy and standard-setting documents relevant to ESD. The collated results of these analyses are applied to an in-depth analysis of the text of the Australian

National Curriculum to search for coherence, or departure from consistency and stated objectives.

In discussing various approaches to, and applications of content and text analysis, Anderson cited the work of three authors in the fields of Social Psychology and Behavioural Science, for defining 'content analysis' as:

> a research technique for the objective, systematic, and quantitative description of the manifest content of communication. (Berelson in Anderson, 1997, p. 1);
>
> a research methodology that utilizes a set of procedures to make valid inferences from text. (Weber in Anderson, 1997, p. 1); and
>
> a method of studying and analysing communications in a systematic, objective and quantitative manner to measure variables. (Kerlinger in Anderson, 1997, p. 1).

The content and text analyses conducted in this investigation are 'systematic' in the processes used for collating the results, which are also 'objective' and transparent, since all the results are provided in the extensive Appendixes in Volume 2, and cross-referenced to the findings of the analyses. The text analysis of the curriculum is mostly 'quantitative' since the relevant instances of values and skills that appear in the relevant areas of the curriculum documents are counted with the aid of computer search facilities. There are also some qualitative assessments made in relation to the depth and relevance to ESD of some concepts.

The analyses of the international and Australian policy documents are also 'quantitative' in identifying for example, the values and skills that appear most frequently and consistently across the documents. The search for issues relevant to ESD and quality educational characteristics, on the other hand, is based on consistent references to similar themes and relevant characteristics across documents rather than merely counting their frequency. The content analysis in this case

seeks coherence across documents in the features and characteristics of ESD described, rather than merely the number of times that they are mentioned in the documents.

With respect to the validity of the use of content and text analysis in research, Anderson stated that the methods involve:

> … the need to select the universe of materials for analysis carefully … to select categories that are meaningful, and to pay heed to questions of reliability and validity. (Anderson, 1997, p. 6)

Implicit within this statement is a series of steps for conducting analysis of texts that are reiterated here, with specific reference to the steps undertaken in applying content analysis to the texts in this investigation.

(1)   Anderson described the first step as selecting "the universe of materials for analysis" (Anderson, 1997, p. 2), in other words, identifying specifically **what** was to be analysed and **which texts** were most likely to contain the relevant information sought. For this investigation, the texts selected for analysis are the international standard-setting and Australian policy documents relevant to ESD mentioned earlier, to identify the values, skills, knowledge and characteristics of ESD, either frequently expressed or common to all documents. Also selected is the Australian National Curriculum, which is evaluated against these criteria for ESD.

(2)   The second step was to "define the **categories** into which the universe is to be partitioned" (Anderson, 1997, p. 2), which Kerlinger considered the most important step since it revealed the "purpose of the research" (Anderson, 1997, p. 1). The categories defined in this study are the **global values, knowledge, skills** and key quality **characteristics of ESD**, since these define the nature of ESD and together provide a comprehensive framework for developing

and evaluating educational policy and curricula for coherence and consistency with ESD, or for gaps and non-adherence.

(3)   The third step was to "determine **units** for analysis", which might for example, be key words, themes, phrases, or concepts that "determine the level of measurement in statistical analyses" (Anderson, 1997, p. 3). In most cases, the units of analysis in this study are the **words and phrases** that represent the **values, knowledge, skills** and **characteristics** relevant to ESD. Where an individual word is the unit of analysis, such as the value of 'respect' for example, a statistical analysis of the frequency and consistent appearance of the word across relevant documents, compared to other values, such as 'honesty' or 'equity', indicates the relative importance of the value.

The ESD characteristics are sometimes expressed in several words or short phrases, such as: 'systems thinking', 'trans-disciplinary approaches to learning', the 'development of the whole learner', 'whole school approaches' and 'student-centred learning' for example. In these cases, the words used to describe a concept may vary across different texts to express the same meaning. For example, 'student-centred learning' may be described as 'tailoring the learning according to individual student needs, abilities and interests'. In these cases, statistical frequency is less appropriate since a qualitative judgement is made as to whether a similar meaning is intended. It is more a case of: (a) deciding whether the same characteristics of ESD are described in the standard-setting documents; (b) collating the consistencies in meaning; (c) looking for these concepts and intended meanings in the text of the curriculum; and (d) assessing whether they appear frequently enough relative to other features, to indicate either emphasis or low importance in the curriculum.

(4)   The final step in Anderson's series was to "determine which units may be reliably quantified" (Anderson, 1997, p. 3). The quantification of the individual ESD values and skills consists of simple frequency counts, which would have a high level of validity. Where a skill might be expressed by more than one word, such as 'systems thinking', a search would be conducted for similar meanings or indicators of systems thinking, such as identifying patterns, links, connections and relationships, which require a sound understanding of the element in question. In this study, professional judgement and qualitative assessments are made as to the presence of curriculum content areas relevant to ESD, and key characteristics of ESD in the documents. This requires careful reading and scrutiny, and while potentially not as accurate as the frequency counts of values and skills, these are nonetheless tallied, quantified where possible, and supported by evidence in the form of specific quotes from the relevant documents. Whether quantified or not, evidence of assessments made in relation to the curriculum are provided in all cases, either in the body of the work or in the Appendixes.

Use of information technology

The ability to access documents in electronic format significantly facilitates text analysis. The careful and appropriate use of information technology, by using the 'search' function in Portable Document Formats (PDF), and the 'find' function in Microsoft Word documents for key words and phrases is of significant benefit when analysing content in texts. These are particularly useful when counting the frequency of particular words representing values or skills, for example, but also when searching for references to particular ESD content, features or concepts using key words and phrases. This involves identifying all the possible key words, phrases and synonyms that may be used to convey a meaning for each concept or content area identified, and also searching for these in the documents. For example, in searching for evidence of the teaching of 'systems thinking', it is necessary to search for derivatives of the word 'system' and for

related concepts such as 'linking', 'connecting', 'joining', and identifying 'relationships', 'patterns', 'trends' or 'sequences', which are all involved in systems thinking. The instances of words and phrases in the documents, with due attention given to context, are then recorded systematically, and grouped or collated according to relevance, similar meaning or frequency. In conducting searches, every form of a word is sought such as, 'link', 'links', 'linked', and 'linking'. However, the numerical result for each search does not merely involve tallying the total number of references; each instance is checked for relevance and meaning in its context. In addition, not all references in a curriculum document are counted. Aspirational descriptions of intention for what the curriculum ought to address, generally in the introductory statements preceding the curriculum itself, and the terms in the glossary at the back of the curriculum document, are not counted. Only those terms that are found in the curriculum descriptions of learning activities and achievement standards are counted, since these represent what is to occur in the learning.

Despite the usefulness of information technology for ease of searching and statistical tallying, this does not replace the need to read each document in its entirety, sometimes many times, to gain an overall sense of the context and intended meanings and emphases, since reliance on counting words alone can potentially distort findings. Particularly when searching for content, a thorough reading with coloured pen in hand to highlight relevant passages where unexpected terminology may be used to convey a meaning, ensures greater accuracy and validity of the assessments made.

Justifying the validity of the findings

The methods used to gather data for compiling the ESD evaluative criteria and the list of global values, knowledge and skills, are tested for their validity against Quine and Ullian's criteria for

coherence (1970). In applying coherentism to a justification for the methods used, it is important to clarify: (a) the **content** of what is shown to cohere; and (b) the **attributes** of the coherence relationship (Quine and Ullian, 1970).

In relation to the **content**, this study seeks coherence among international and Australian documents relevant to ESD to form a framework of values, knowledge, skills and characteristics of ESD that brings together the commonalities expressed in these documents. Coherence is then sought between the resultant evaluative criteria for ESD and the Australian National Curriculum, highlighting areas where coherence is not found, in order to suggest potential enhancements.

More specifically, coherence is sought in the following areas:

(a) the **global values** for ESD expressed most frequently in relevant international documents, with Australian values drawn from various sources including the National Framework for Values Education (DEST, 2005), and with the values in the curriculum (ACARA, 2010b, c, d, e);

(b) the **knowledge and skills** for ESD as stipulated in the IIS and other related international and Australian policy documents, with the knowledge and skills for ESD in the curriculum; and

(c) the **characteristics** of ESD as stipulated in the IIS and other related international and Australian policy documents, supported by a range of scholarly research, and summarised in the evaluative criteria for ESD, with relevant features in the curriculum.

With respect to the **attributes** of the coherence relationship, the coherentist principles listed here as summarised by Evers (1999, pp. 273-274), based on Quine and Ullian (1970), as well as Evers and Lakomski (1991), are applied to the relationship between the ESD values, knowledge, skills and ESD characteristics on the one hand, with those reflected in the Australian National Curriculum on the other.

Empirical adequacy

Research requires the demonstration of adequate empirical evidence to justify its strength. In this study, theoretical claims requiring proof are not made, since the documents used to arrive at the list of global values and ESD evaluative criteria against which the curriculum is analysed, represent the consensus of expert educators and country representatives from the many nations that are member states of Unesco and other UN agencies. The content of these normative and standard-setting documents therefore comprise the collective knowledge and experience of international experts in education, derived from lengthy consultation processes, feedback and agreement. In addition, the values and criteria are drawn from numerous documents that are for the most part consistent with each other, with few conflicting views evident.

Consistency

This investigation identifies significant commonalities among documents relevant to ESD to arrive at the global values, skills, knowledge and ESD criteria. In exploring the potential universal or inherent nature of certain values, recourse is made to: (a) the work of Armstrong (2006), who traced the emergence of some core values and morals among the Axial peoples over 3000 years ago; (b) the commonalities among values of World Faiths expressed through key documents of the global interfaith movement; (c) the expression of values in education by some educational thinkers across cultures, as identified in Unesco's four volumes of *Thinkers on Education* (Morsy, 1997); and (d) the work of Damasio (1994), Pinker (2003), Haidt (2004), and other moral psychologists and theorists, regarding the prevailing view that certain values were both inherent and socialised. This evidence can be used to support the view that certain human values may be logical, self-evident and relatively consistent over time, notwithstanding cultural differences and the emergence of new values with changing circumstances (e.g. environmental conservation, gender equity and intergenerational equity). Consistency is also sought between the global values, knowledge, skills and ESD characteristics, on the one hand, and the equivalent

features in the national curriculum, on the other, resulting in the identification of gaps and inadequacies, but also strengths where the ESD criteria are met.

Comprehensiveness

This study needs to be comprehensive in the evidence examined, by analysing key international and Australian documents relevant to the characteristics of ESD stipulated in the IIS and other related documents. The examination of the curriculum against the global values, skills, knowledge and ESD criteria, needs to be thorough, comprehensive and detailed, in tabulating and comparing each instance of values, skills and content relevant to ESD in the curriculum text. The only area that must be acknowledged from the outset as not being comprehensive involves the unavailability of certain learning areas in the curriculum for analysis. At the time of writing, only four learning areas have been developed, but this must be considered to be sufficient for identifying overall characteristics, strengths and gaps, since the four learning areas are intended to cover the foundation subjects of the curriculum.

Simplicity

Although comprehensive, the analyses of the various documents and the curriculum are not overly complex, nor difficult to follow or understand. The language used in writing the results of the study is simple, clear and easy to comprehend, with extensive Appendixes in Volume 2 for reference and substantiation of claims. The conclusions drawn are based not on unexplained assumptions, but on the collective experience of education experts from Australia and most Unesco member countries, expressed in existing normative and policy documents. This study extracts this collective knowledge and synthesises it into checklists that are easy to use and apply to education policy, school curricula, and school-based programs. The intention is for the reader to find the subject matter interesting, relevant, informative, and readily applied in practice.

Learnability

The synthesis of the key documents in this study, contained in the Appendixes, needs to be easily understood and learned by interested readers and researchers for application in their work. In addition, the analyses undertaken can be replicated by others to obtain similar results because of the strong coherence and consistency across relevant documents in the values, skills, knowledge and characteristics identified for ESD.

Explanatory Unity

Evers described 'explanatory unity' as being the result of "combining both simplicity and comprehensiveness" while accounting for "the most phenomena using the least theoretical resources" (Evers, 1999, p. 274). Since 'simplicity' and 'comprehensiveness' are discussed above, it is sufficient to state that the 'phenomena' of the global values, skills, knowledge and ESD criteria are derived primarily without recourse to 'theoretical resources', but depend rather on the collective experience and consensus of expert educators across a majority of countries, based on their knowledge of what leads to positive educational outcomes.

Conclusion

This investigation develops recommended criteria for implementing ESD, which include the global values, knowledge, skills and ESD characteristics, based on existing international policy and practice, to address current global concerns embraced by ESD. The development of the Australian National Curriculum is investigated against these criteria, with the aim of informing further education policy and curriculum development and future curriculum iterations. It is intended that this study generate ESD awareness, diverse perspectives and innovative approaches to ESD among educators. This investigation begins with an examination of the nature of values and their role in education in the past, and in contemporary global and local contexts.

CHAPTER 4:   **EDUCATION AND VALUES**

Introduction

Values can influence behaviour powerfully, motivating choices, decisions and actions, and shaping interactions. Both implicit and explicit values are present in schools, whether intended or not, reinforced by teacher expectations and responses, prescribed texts, discussion topics, and how work is assessed. Science teachers value facts over opinion, Physical Education teachers foster teamwork, Language teachers promote tolerance and mutual respect, and Art teachers foster creativity. Educators must therefore understand the nature of values, be aware of their own values, and of how they influence learners.

The role of values in education is investigated here, including the origins, types and classification of values, and their application to education today. This chapter draws on: (a) Connell's historical study of educational theory and practice in the twentieth century (1980); (b) two international landmark reports on education convened by Faure in 1972, and Delors in 1996; and (c) Morsy's compilation of the work of educational thinkers across cultures over 2,500 years. This brief analysis reveals that values in education across time and cultures, have consistently prepared learners to adapt to change, also needed at this time.

The nature and purpose of education

The term 'education' derived from a Latin borrowing with two sources, the verbs *'educere'* meaning 'to lead forth or to draw out', and *'educare'* meaning 'to form or train', referring to the rearing, training and raising of children (Cavanagh, 2002). The differing views of education conveyed by these terms persist today, one representing a humanist approach to drawing out the full potential of learners for life, learning, citizenship and work, proposed by the Faure (1972)

and Delors (1996) reports, and the other, instrumental approaches to education preparing learners for employment. At this time, both approaches are needed.

According to the Faure report (1972), education reflected the features and intentions of society and "humanity's most noble ideals", citing as examples education in primitive and agrarian societies, which emphasised the transmission of traditions and values to form "character, aptitudes, skills and moral qualities" (Faure, 1972, pp. xxii-4). The report found that Indigenous societies were "imbued with values" providing a potential "source of inspiration … for universal thought" (Faure, 1972, p. 11), and that education was informal and mostly oral, as children learnt by "living and doing" in the family and the community (Faure, 1972, p. 5). For traditional Australian Indigenous peoples, learning involved observation and imitation of elders and kin, and from adolescence entailed more formal verbal instruction (Hughes and More, 1997). Since change occurred slowly in these societies, the knowledge of elders was passed down by word of mouth and remained relevant across generations, in contrast to rapidly changing knowledge in all fields today.

Learning later changed with written language, formal schooling, and colonisation, and later still, with industrialisation, technology and telecommunications, as the education models of Western colonisers were widely adopted, even if not always culturally appropriate. The Western system of reason, scientific thinking and a values focus on justice, eventually gained precedence in many places throughout the world, emphasising development and modernisation through industry and technology, with both gains and losses in the process.

The two most significant international organisations that influence national education policy are the United Nations Educational Scientific and Cultural Organization (Unesco), and the

Organisation for Economic Cooperation and Development (OECD). Although their purposes differ, their respective educational policies reflect the tension between functional and humanist approaches. Whereas Unesco seeks to promote peace, human rights, sustainable development and international understanding, the driving force for the OECD is economic cooperation and development, However, this difference is one of emphasis, since both are needed for promoting a balanced approach to the social, cultural, environmental and economic dimensions of Education for Sustainable Development (ESD), through lifelong learning and development.

Although 24 years apart, the Faure and Delors reports shared the view that: (a) the international community had "common aspirations, problems and trends"; (b) lifelong education was integral to democracy and the "complete fulfilment" of the whole person, necessary for positive societal change; and that (c) learners had the right to realise their full potential and contribute to desired societal change (Faure, 1972, pp. v-vi). The Faure report also promoted "scientific humanism", claiming that education needed to orient science and technology towards human well-being based on values, rather than solely towards financial gain (Faure, 1972, pp. xxvi-xxvii). The Delors Report emphasised values and learning to live together harmoniously in an increasingly interdependent and globalised world, for peace, human rights, freedom, social justice and human development. Lifelong education was to draw out the creative potential of the learner to reveal a treasure of talent and ability within (Delors, 1996). ESD builds on the foundations established by these two reports.

The British educator Sterling (2001, p. 25) distinguished between four main functions for education, which varied in emphasis and importance at different times, namely: (a) the transmissive, socialisation function, for replicating culture and society and promoting citizenship; (b) the vocational function (i.e. functional, utilitarian), for training people to be

productive in employment (c) the intrinsic, humanist or liberal function, which emphasised individual development towards reaching maximum potential; and (d) the transformative function, fostering change for a better and fairer society (Faure, 1972, p. 56). The first two were instrumental, emphasising purpose, end product and measurement of outcomes; the third was intrinsic, focused on personal development leading to societal change, requiring an emphasis on process and a quality learning experience; and the last one was both instrumental and of intrinsic value, since it led to a peaceful, just and sustainable society.

A balance of all four is necessary for the successful and balanced implementation of ESD to: (a) maximise learner potential by developing the whole person; (b) transmit the desired values, cultural practices and traditions; (c) develop the workforce for socio-economic development; and (d) contribute to both individual and societal change. Values are central to each of these and are needed more than ever today to address the increasing complexity and seriousness of contemporary challenges.

Understanding the nature of values

In order to facilitate values development in learners, educators first need to understand the nature of values, as distinct from beliefs, and to become aware of the significant influence that the values unconsciously or deliberately expressed in their words, actions and behaviours, have on learners.

There are many definitions of 'values' but among the most often quoted was:

> Values are the ideals that give meaning to our lives that are reflected through the priorities we choose, and that we act on consistently and repeatedly.
> (Hall, 1994, p. 21)

Certain other definitions that were regularly quoted indicated a tendency to confuse values with

beliefs, as follows:

> The priorities individuals and societies attach to certain beliefs, experiences and objects, in deciding how they shall live and what they shall treasure. (Hill, 2004, p. 235)

> Values are internalised sets of beliefs or principles of behaviour held by individuals or groups. They are expressed in the way people think and act. (Keown, 2005, p. 5)

In these and other definitions, values have been described variously as ideals, priorities,

thoughts, ideas, principles or beliefs that guided choices, decisions, actions and behaviours,

through an internal process that engaged thinking and emotions. But there was no moral

dimension to indicate whether the values were right, good, just, fair, positive, desirable or

otherwise.

Halstead and Taylor's definition of 'values' did include a moral dimension as follows:

> … the principles and fundamental convictions which act as general guides to behaviour, the standards by which particular actions are judged as good or desirable. (Halstead and Taylor, 2000, p. 169)

Gore, an Australian educator, highlighted the benefits and difficulties of linking values with

morals in education, which can be problematic in a multicultural and secular society such as

Australia.

> Values education has always been linked to moral education and this link has at times been helpful in elucidating good practice and at other times less than helpful, as it plunged educators into moral philosophy. (Gore, 1998, p. 1)

Gore considered that the judging of values as good or bad depended on many factors, suggesting

that moral values were subjective and relative to the person or context, and not objective.

Halstead distinguished between personal, subjective and relativist opinions and preferences at

one end of a continuum, and absolute judgments of right or wrong irrespective of circumstance,

at the other (Halstead, 1996, p. 6). Yet he also identified a middle point on the continuum for

certain socially constructed values that were explored and agreed upon in an objective and systematic way, which he considered to promote "human well-being" more than others (Halstead, 1996, pp. 5-6), without being judged as either good or bad. In this study, such socially constructed global values are drawn from international documents relevant to ESD, that are agreed upon as appropriate for education to adopt, for the creation of a sustainable society.

Aspects of Rokeach's definition may be applied to sustainability, since it described a 'value' as:

> An enduring … code of conduct or state of existence (that) is personally and socially preferable to alternative modes … that once internalised becomes a standard or criterion for guiding action. (DEST, 2003, p. 170)

This definition referred to the 'enduring' nature of values (very much needed in the long term for sustainability), reflected in a 'code of conduct' (i.e. actions and behaviours), and in a 'state of existence' (i.e. state of being, lifestyle, identity), which was not morally judged as right or good but as 'preferable'. Deeming a value 'preferable' rather than 'right', can facilitate agreement for the common good, without negating diverse socio-cultural or religious values in the process. The Rokeach definition included both personal and societal values, thus embracing both individualist and collectivist cultures, and linking the development of personal values with application to society for shared benefit. The necessity to 'internalise' values, highlighted in the Rokeach definition, is integral to the developmental process of values education, forming a "standard or criterion" (i.e. the consistent basis or guide) for all future 'action'. This involves going beyond good intentions to consistent action. A dilemma for educators is striking a balance between encouraging **preferred** values, and drawing out from learners **freely chosen** values, more likely to be authentically enacted, rather than merely fulfilling expectations when being observed. On the other hand, freely chosen values, unless guided skilfully, may not always be socially desirable or beneficial.

Based on this analysis, the working definition of 'values' used in this study refers to socially constructed and agreed ideals, principles or priorities that, once internalised, endure, and consistently guide actions, behaviour, decisions, choices, lifestyles and work practices. Moreover, these values are directed towards individual and collective well-being, with specific application to sustainable development: social, cultural, environmental and economic.

Clarifying values-related terms

The review of values definitions above, reveals that a number of terms are used interchangeably to denote 'values', such as beliefs, morals, principles, ethics, attitudes, disposition, character and virtues, often defined in relation to each other, despite differences. Distinctions must be made between these terms to clarify the specific meaning of 'values'.

Values are not beliefs but are akin to abstract and generalised 'principles' that underpin choices and actions. Hill suggested that values were "the big concept" (Keown, 2005, p. 6), and although **informed** by beliefs, educators need to distinguish between their personal, religious or political beliefs, and agreed values. Since beliefs were merely "opinions" (Oxford, 2005, p. 128), which might not be shared by the school community, it is preferable for teachers not to promote their political, religious or other beliefs to students.

The term 'attitudes', which often accompanied the term 'values', represented settled ways of thinking, feeling or behaving (Oxford, 2005, p. 85), or "a disposition to think or act in a certain way" (Keown, 2005 p. 6), according to firmly held beliefs based on past experience. While some attitudes are positive, others may reflect underlying personal views based on unconscious bias or preference, potentially at odds with community agreed values, or having negative impacts. In educational policy and curriculum documents, 'attitudes' were sometimes accompanied by the

term 'dispositions', referring to positive qualities of character and behavioural tendencies (Oxford, 2005, p. 441).

The terms 'ethics', 'virtues' and 'morals' emerged from the field of philosophy with related meanings and moral connotations. 'Ethics', from the Greek *'ethos'* meaning conduct and character, were defined as "moral principles or rules of behaviour" (Oxford, 2005, p. 520) often applied to occupations and professions, while 'virtues' were "behaviour or attitudes that show high moral standards" (Oxford, 2005, p. 1705). 'Morals', from the Latin *'mores'* meaning customs or habit, referred to the "standards or principles of good behaviour" (Oxford, 2005, p. 991).

Dewey considered 'morals' to be concerned with conduct, consequences of actions, and the "movements which carry out motives", occurring externally as "outside of mind". Character, on the other hand, related to "inner" consciousness, while acknowledging that different schools of thought identified morality with either the "inner state of mind or the outer act and results" (Dewey, 1916, p. 347). However, Dewey maintained that it was **external action**, conduct and results that counted as the "sole measure of morality" rather than merely "meaning well" or having an "inner ideal of conscience" or good intentions (Dewey, 1916, p. 349). For ESD to be effective, values learning experiences need to be designed in ways that enable learners both to internalise values and practise them in action, so that values are not merely held conceptually but are also enacted consistently, guiding choices and decisions as a living reality rather than remaining an ideal.

'Virtues' were generally seen as acquired character traits or qualities, based on internalised values as the underpinning basis of decisions and actions. Hall considered that "virtues are a

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specific subset of values, that are narrower in their intention and purpose" while values "are the basic elements that stand behind all human behaviour, and … are wider in scope" (Hall, 1994, p. 24). Hall further argued that while "human virtues came from philosophers and religious thinkers, the concept of human values came from social psychologists and educators" more recently (Hall, 1994, p. 25). From the mid 1960s to the late 1970s educators developed an interest in examining moral values, which led to the values clarification movement (Connell, 1980, p. 395), which is discussed later.

The distinctions between these terms are admittedly fine, and there is some overlap in meaning, but the important distinction to be made in education, is between 'beliefs' and 'values', with implications both for the teaching and assessment of values. Bloom defined 'belief' as "the emotional acceptance of a proposition or doctrine" with varying degrees of certitude, at times bordering "on faith … upon admittedly non rational grounds" (Bloom, Hastings, Madaus, 1971, p. 275). The Affective Domain of Bloom's *Taxonomy of Educational Objectives* involved a progression along a continuum in a sequence of five stages, namely: (a) receiving, attending, perception or general awareness at the lowest level; (b) responding, passively and eventually more actively; (c) valuing the worth of things, behaviours or phenomena, equated at this level with attitudes and beliefs, with varying degrees of certainty and commitment; (d) categorisation of values and their organisation into a "harmonious and internally consistent" value system (Bloom, 1971, pp. 276); and, at the highest level (d) the internalisation of a generalised set of values or harmonised value system, into a total philosophy or world view that was internally consistent, and which determined all actions and behaviours, thereby characterising the individual. Although Bloom acknowledged that "attitudes, behaviors, beliefs or ideas" informed the internalised value system or life philosophy, 'beliefs' were placed at the lowest level of the

'valuing' phase three, while the highest level of affective development was presented as consistent action according to a unified set of values (Bloom, 1971, pp. 275-277).

This thesis argues that global values for ESD represent a set of principles or values to be internalised and actioned, which together form a coherent world view necessary for a peaceful, just and sustainable society. Global values therefore fit within the fourth and fifth stages of internalisation of the Affective Domain in Bloom's Taxonomy, relating to the 'conceptualisation and organisation' of values. Nonetheless, the acquisition of such values also involves the cognitive domain in understanding, analysing, reasoning, evaluating and applying values in practice. In this study, values are presented as involving interlinked cognitive, affective and behavioural processes, consistent with Bloom's view of the relationship between these elements (Bloom, 1971, pp. 228).

Educators cannot avoid expressing their values, as these are reflected in their actions, behaviours, words, inclusions and omissions, and in their very identity in relationship with others. Beliefs on the other hand, are not verifiable, but merely an expression of what an individual believes to be true, whether relating for example, to religion, politics, extra-terrestrial life or astrology. Failed efforts to introduce into Australian public education, intelligent design and rejecting evolution for example, highlight the importance of separating agreed values from religious beliefs or ideology, particularly in a culturally and religiously diverse context.

School communities may debate the extent to which teachers can express their personal beliefs to older students in the interests of, for example, comparing and contrasting various belief systems to stimulate thinking, and deepen appreciation and understanding of diversity. Comparative exposure to diverse belief systems and ideologies can develop discernment and

critical thinking, while assisting learners to identify, clarify and consolidate their own emerging beliefs. Nonetheless, teachers must be mindful of the influence their beliefs have on learners and focus instead on the teaching of values applied to a wide range of situations.

While values education in other countries may be known by other names, such as 'moral education', 'ethics education' and 'character education', 'values' is the term commonly used in the context of ESD, both in Australia and internationally, and is the one used in this study.

Types and categories of values

There have been many attempts to categorise values, morals and virtues, from ancient Greek Philosophy in the West, to Confucianism in the East. In the West, Aristotle classified virtues into two types, moral and intellectual. Moral virtues equated with Plato's four cardinal virtues of wisdom, understanding, temperance and prudence, later adapted and expanded by Aquinas to form the seven enduring Christian morals or virtues of faith, hope, charity, prudence, temperance, fortitude and justice. Aristotle's intellectual virtues, or character traits required for right action and correct thinking, included justice, perseverance, empathy, integrity, confidence in reason, intellectual courage and autonomy.

All cultures and religious faiths have had their respective lists of values, morals or virtues, describing what it meant to lead a good life, which differed over time and according to place and context. A hierarchy of values might indicate which values had greater priority based on need, or were more important from an ethical or moral perspective, varying from one culture or context to another. Motivation based on need might determine the relative priority given to certain values, as evidenced by the values implied in Maslow's hierarchy of human needs (Maslow, 1943, pp. 370-396), listed in Appendix 21.

What distinguishes one category of values from another, is the specific purpose or application of the value. Hall identified the purpose of Aristotle's virtues as being for happiness, while for Locke values were considered those that were advantageous to society, and for Hobbes and Spinoza they were directed towards self-preservation (Hall, 1994, p. 23). In collectivist cultures, values were directed towards individual development for societal benefit, while in modern Western societies, individualism and personal gain often took precedence.

Since the emergence of ethics in ancient Greece, philosophers had argued about the 'intrinsic' or 'extrinsic' worth of things. Values also might have 'intrinsic' moral merit (e.g. justice), or 'extrinsic' worth, based on their positive consequences for society, thereby also being 'instrumental'. Although classifications might be subjective, it could be argued that global values for sustainable development had both 'intrinsic' and 'extrinsic' worth, since they were of worth both to individuals and to society.

In defining values in education, Dewey distinguished between two meanings, namely: (a) to appreciate, cherish or prize something intrinsically for its own sake; and (b) to compare, judge and evaluate to indicate a preference or choice among possibilities, generally towards an instrumental end (Dewey, 1916, pp. 249-249). In a similar vein, Rokeach referred to 'terminal' and 'instrumental' values; the former being concerned with "**end** states of existence", such as a comfortable life or world peace (Rokeach, 1973, p. 7), and the latter with "modes of conduct" or the **means** to achieving an end, such as ambition (Rokeach, 1973, p. 28).

Hall and Tonna developed an inventory of 125 values, based on over ten years of research (Hall, 1994, p. 29), which they divided into four phases of consciousness, occurring over eight stages of life, also representing eight world views (Hall, 1994, p. 32). These values were further divided

into one of three areas: (a) 'foundation values', representing basic needs that enabled action on current values and that dominated in times of stress or crisis (e.g. safety, security, self worth, care); (b) 'focus values', representing values and priorities that informed decisions; and (c) 'future' or 'vision values', representing an aspirational view of the future that motivated development towards enacting those values (Hall, 1994, p. 84). Global values for sustainable development fell into all three categories since they related to: (a) values needed in crisis; (b) values that informed contemporary decisions; and (c) aspirational 'future' or 'vision values', to which humanity aspired, since these contributed to the well-being of societies and their environments.

Schwartz conducted surveys of 25,000 people in 44 countries of diverse cultures, and identified 56 universal values and ten types of universal values, which correlated approximately with Maslow's hierarchy of needs, and Hall and Tonna's eight world views. Among the ten categories of universal values was 'universalism' itself, which comprised wisdom, social justice, equality, peace, broad mindedness, beauty, unity with nature, protecting the environment, and inner harmony. Many of these values were among the global values needed for sustainable development (Schwartz, 1994, pp 19–45). These are discussed in Chapter 6.

Hall claimed that both Maslow and Rokeach identified the 'subjective' and 'objective' dimensions of values. 'Subjective' values expressed personal preferences and chosen priorities that were emphasised in values clarification approaches to values education. 'Objective' values involved moral values with traditional objective standards, to which Kohlberg referred in his six stages of moral development (Hall, 1994, p. 30), although Haidt (2004) identified four other moral systems that were also considered 'objective', discussed later in this chapter. Global values for ESD represented 'objective' standards that were considered by the international

community to be necessary for the development of sustainable societies, but were also 'subjective', reflecting personal preferences for how individuals might wish to be treated (e.g. respect).

Other categorisations of values were contained in the teacher sourcebooks produced by Unesco's Asia Pacific Network for International Education and Values Education (APNIEVE), based on the four Unesco pillars of learning outlined in the Delors Report, namely: learning to know, learning to live together, learning to be, and learning to do (Delors, 1996). The first APNIEVE sourcebook, *Learning to Live Together in Peace and Harmony* (APNIEVE, 1998, p. 6), divided values into those relating to: peace, human rights, democracy and sustainable development, which correlated closely with the dimensions of sustainability (i.e. social, cultural, environmental, and economic) described in the IIS. In the subsequent sourcebooks, *Learning to Be* (APNIEVE, 2002, pp. 25-26) and *Learning to Do* (APNIEVE, 2005, pp. 16-17), values were further categorised according to eight dimensions of human life, relating to both the individual and the collective, namely, physical, intellectual, moral or ethical, aesthetic, socio-cultural, economic, political and spiritual.

These closely matched the 11 domains outlined in the documents accompanying the National Framework for Values Education in Australian Schools (NFVE), established in 2004 to facilitate the integration of values in education, namely: (a) interpersonal-relational, (b) socio-cultural, (c) political-civic, (d) religious-spiritual, (e) ethical-moral, (f) cognitive-intellectual, (g) technical-vocational, (h) economic, (i) educational, (j) physical-recreational, and (k) aesthetic (Commonwealth of Australia, 2005, p. 6). The difference between the APNIEVE categorisation and the NFVE model of domains was that the individual alone was placed at the centre of the NFVE framework, with no reference to the collective, whereas the APNIEVE framework

acknowledged the role of the individual as part of, and contributing to the collective. In addition, the natural, ecological or environmental domain was absent from the NFVE list, although it was implied in the value of 'responsibility' that appeared in the list of nine NFVE values in the framework.

A moral classification system of 'intuitive ethics' that purportedly crossed cultural boundaries was developed by Haidt (2004) to explain cross-cultural variation and similarities in morality. Haidt described moral systems as:

> … interlocking sets of values, practices, institutions, and evolved psychological mechanisms that work together to suppress or regulate selfishness and make social life possible. (Haidt, 2007)

Haidt claimed that moral diversity among cultures occurred because one or more aspects of these universally innate, psychological moral systems developed more than others, depending on socialisation, circumstance and experience. He identified two universally applicable, evolutionary mental systems that influenced moral behaviour involving 'moral intuition' and 'moral judgement', and four families of emotions underpinning intuitive moral responses and choices, which he used to explain five innate and universally available psychological moral systems containing components of morality common to most societies, namely: (a) harm and care, (b) fairness and reciprocity, (c) in-group loyalty, (d) authority and respect, and (e) purity and sanctity (Haidt, 2004). These are described in Appendix 4 and again in Appendix 19, and are compared to global values.

(a) Harm and care; and (b) Fairness and reciprocity

The moral systems of 'harm and care' and 'fairness and reciprocity', familiar to the West since the Enlightenment period, protected individuals by preventing harm, and promoting justice, which later characterised modern Western liberal democracies, in which individual freedom and

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justice became paramount. However, Sen (2000), Glendon (2001), and Pinker (2003, p. 272) challenged Haidt's view that the moral system of individual 'justice' and rights was less common in the East, where ethics of autonomy and fairness also had deep roots. Both Hume (1739) and Kant (1785) advocated principles of justice and fairness, reflected in Kohlberg's stages of moral development (1958), Rawls' theory of justice (1971), and Trivers' theory of reciprocal altruism and justice (1971). These contrasted with Gilligan's (1982) feminist perspective on ethics of care, which emphasised relationships, loyalty and interdependence. Both of these moral systems (i.e. 'justice' and 'care') were contained in Turiel's definition of morality as "prescriptive judgments of justice, rights, and welfare pertaining to how people ought to relate to each other" (Turiel, 1983, p. 3). But Turiel emphasised rationalism without acknowledging innate or intuitive components of morality.

(c) In-group loyalty; and (d) Authority and respect

The moral systems of "in-group loyalty' and 'authority and respect', were less familiar to the West, and more commonly found in Eastern communitarian societies. This, according to Haidt (2004), led to high creativity, but weak social structures, reduced cooperation and depleted social capital in individualistic Western societies. However, Pinker (2003) maintained that the ethics of 'group loyalty' and 'authority' were also pervasive in both the secular and Christian West.

(e) Purity and sanctity

The moral system of 'purity' and 'sanctity', often connected to religious systems, while positive in maintaining stability, also led to discrimination, exclusion and conformity, especially with respect to gender roles, and denial of justice, rights and care for those outside the group. One such example relates to the Dalits (i.e. the untouchable caste of India). In the West, there were overlaps between 'sanctity' and 'purity', in which status was often conflated with virtue, contamination with sin, and the good with the clean (Pinker, 2003, p. 273-280).

Haidt proposed that a balanced emphasis on all five moral systems, a blend of East and West, offered a socially-constructed global system that would be universally acceptable for living together harmoniously. Haidt's five moral systems appear to be the most comprehensive and relevant for categorising global values for sustainable development. However, this study proposes the addition of a sixth Indigenous value system of 'living in harmony with nature', and a broadening of the scope of the fifth moral system of 'purity and sanctity', to include a shared sense of the sacred, expressed through reverence for the Earth, and for the sanctity of humanity and of all life for a sustainable future. These proposed amendments are added to Haidt's framework in Appendix 19. The most appropriate system of global values for ESD can therefore be considered as being universally applicable and balancing individual with collective interests for human well-being, without denying cultural diversity or traditional values not covered by the framework. An analysis of global values within an adaptation of Haidt's framework is discussed in Chapter 6.

Values in education or education in values?

It is necessary to differentiate between the terms 'values in education' and 'education in values', more commonly termed 'values education'. Halstead (1996) described 'values in education' as values that implicitly informed the hidden curriculum and school ethos, while 'education in values', henceforth termed 'values education', referred to values which schools taught explicitly. Halstead acknowledged the close connection between the values taught and those modelled in the organisation of the school, consistent with the argument in this study that both are needed:

> The part schools play in the teaching of values and the part values play in the organisation of schools are closely connected. (Halstead, 1996, p. 3)

While both implicit and explicit values play a role in shaping student values, congruence and coherence across the school and curriculum are considered important for reinforcing values,

requiring stated values to match those that are modelled in practice. However, even where school values statements existed, "there is likely to be a considerable difference between the values a school proclaims and those which in fact underpin its practice" (Halstead, 1996, p. 4).

The National Framework for Values Education in Australian Schools (NFVE) adopted a broad definition for 'values education' that encompassed knowledge, understanding, dispositions and skills for enacting values:

> Any explicit and/or implicit school-based activity which promotes student understanding and knowledge of values, and which develops the skills and dispositions of students so they can enact particular values as individuals and as members of the wider community. (DEST, 2005, p. 8)

Although this definition did not distinguish between values in education and education in values, it was intended that the NFVE did both. Keown supported the inclusion of values in all aspects of educational activity, whether implicit or explicit, "in the aims, purposes, principles, structure and content of the curriculum … (and) in the learning processes, the skills and competencies" (Keown, 2005, p. 7).

The Northern Territory Education Department made three further distinctions in values education respectively as 'content', 'process' and 'application':

> *Education about values* … values education as **content**.
> *Education through values* … values education as **process**.
> *Education for values* … values-based problem-solving … which builds on education about, and education through, values. This is values education as **application**.
> (DEET, 2005, p. 6)

This study proposes an additional distinction, 'education **as** values', based on Sterling's framework of educational responses to sustainability cited earlier, as being education **about**, **for** and **as** sustainability: (a) education **about** sustainability was content-based, leading to little or no change; (b) education **for** sustainability involved reform within an existing educational

paradigm; and (c) education **as** sustainability, which brought about third order learning **as** change, since it "engages the whole person and the whole learning institution" in enduring change towards sustainability (Sterling, 2001, pp. 60-61). In this transformative approach, the whole school ethos is actively and consciously informed by agreed values, reflected in changes to all aspects of school operations, policies, relationships, curriculum, teaching materials and the behaviour of all school community members. This whole school approach was also emphasised in the NFVE.

Hill supported the need for both the explicit teaching of values in the curriculum as content and as "analytic skill development", and for "the modelling implicit in school administration and teaching style" based on negotiated values within the school community and the wider society (Hill, 2004, p. 235).

A comprehensive and transformative approach to values education is similarly advocated in this study that includes the above aspects of values education as 'content', 'process', 'action' and overall 'ethos', so that what is learned and enacted is also what is modelled. This requires school community involvement and awareness among school staff of the values conveyed by their words, actions and behaviour, with implications for pre-service and in-service teacher and staff education.

Values education across time and cultures

Connell contended that education had always included a moral or ethical dimension, based on the work of leading philosophers and religious thinkers from the West, the East, and the Middle East, since classical times:

> Education throughout most of human history has been concerned principally with handing on an established intellectual and moral tradition. (Connell, 1980, p. 6)

Faure also found that education in agrarian and Indigenous societies had always emphasised the transmission of traditions and values (Faure, 1972).

From the Ancient Greek and Roman focus on ethics and moral virtues of wisdom, understanding, temperance, prudence, fortitude and justice, to traditional Confucian and Daoist emphases on filial piety, loyalty, humanity, goodness, ritual and personal character, inner strength, integrity and kindness, descriptions of what constituted a virtuous, ethical or moral person existed in almost every culture and religious faith, transmitted through various forms of education in those traditions. An understanding of the role of values in education in the past, can offer insight to the role they may play now and in the future, in preparing learners to live and work sustainably in times of change.

While there are many educators throughout human history who can be discussed, a few in each of the Western, Eastern and Middle Eastern cultures are selected from ancient to modern times, and their thinking summarised in Appendix 5. An analysis demonstrates that, for the most part, across time, cultures and changing circumstances, the purpose of education has similar themes, developing knowledge, skill, and character or personal qualities, the latter consisting of fostering values, virtues, ethics or morals, for the dual purpose of attaining individual happiness and vocational fulfilment, as well as for the benefit and well-being of society. Nonetheless, there remain differences in educational emphases for meeting local needs that can lead to different societal outcomes.

In view of the shared sustainability challenges that are presenting both locally and globally, impacting upon all societies, education is challenged to adapt contextually to the changing needs

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of the period, according to socio-cultural and geographic demands, but with a uniformity of underpinning principles that did not exist in the past.

> … the countries of North and South, of East and West … have more in common than they thought. Environmental problems and ecological imbalances impinge equally on all. (Morsy, 1997, Vol. 2, p. 717)

Impact of educational change on values education in the twentieth century

The educational changes that occurred in the twentieth century, also summarised in Appendix 5, led to a tendency to "more actively question and to break with established tradition" (Connell, 1980, p. 6), requiring a shift from transmitting and inculcating values through education, to values clarification and autonomous critical inquiry that was positive and constructive, in the process of forming personal values.

These changes accompanied an increasing concern with educational psychology focused on human behaviour, cognition, developing understanding and creativity, the application of knowledge and skills, a search for meaning, motivation, and active participation in the education process. The growth of sociological thought brought about increasing awareness of the importance of relationships, positive social environments, classroom dynamics, and the emotional state of the learner, with implications for values education. The twentieth century brought the realisation that, "man does not merely think, but also acts and cares", so education began to "assist young people to learn how to act effectively and responsibly" (Connell, 1980, p. 13). Over the course of a century, values education had expanded from emphasis on good behaviour, hard work and patriotism, to concerns with social responsibility, equality, creativity and critical thought directed at solving societal problems.

Previously, education had transmitted knowledge, skills, values and traditions, to prepare elite learners for the needs of the times, with minimal outside influence. The period of the 1960s and

1970s in the West saw a revolutionary break with the past, reflected in the work of progressive and alternative educational thinkers, partly demanded by students in their "quest for new values for a new world" (Faure, 1972, p. 149), as they sought to reconcile the gap between rhetoric and action in the world around them. This generation of youth, who were educated in more liberal ways, came to question almost every aspect of the status quo, beginning in the 1960s and culminating in worldwide student unrest by the end of the decade. This youth movement was characterised by social and political protest calling for greater socio-economic justice, peace, civil rights, equality and transparent democracy, challenging traditional values and demanding social, cultural and political transformation, while also spawning the beginnings of the environmental movement.

From the mid-1960s to the late 1970s there was a growing interest among educators, some of whom belonged to this generation, in the clarification and assessment of moral values. While previously the focus had been on inculcating and modelling values to develop certain character traits or unquestioned moral virtues relevant to the time, the turmoil of the 1960s saw the conscious and explicit development of human values in education by educators and social and educational psychologists, but with an individualist approach, at least in the West.

In the 1970s, the values education movement flourished in two directions, one involved values clarification to facilitate learner exploration of values and lifestyle choices, rather than following predetermined societal values, and the other, led by Kohlberg, fostered moral reasoning, critical thinking and values analysis, by using moral dilemmas for example, enabling learners to judge for themselves which values were more appropriate. A blending of both these approaches is needed for ESD, to respect individual informed choice, and to enable the critical questioning of existing practices and lifestyles with a view to developing more sustainable ones.

In a values clarification or valuing process developed by Raths, Harmin and Simon (1966), criteria were identified for choosing and forming values, which were to guide educators. The criteria included choosing values freely and consciously from among alternatives, and after thoughtful consideration of the consequences, followed by public affirmation and repeated action based on those choices (Hall, 1994, p. 26). The values choices that learners made were personal and subjective, according to personal priorities, seemingly without the imposition of objective standards, and made meaningful by repeated actions and life decisions based upon them.

While incomplete, these approaches are still relevant today, for raising conscious awareness of the values that underpin choices and actions, rather than following without question the values of peers and of screen-based cultures, and for applying reasoning and critical thinking to decision making. However, in the absence of an objective moral standard for guiding choices and decisions, learners might adopt values that are personally or socially negative or undesirable. This tension between freedom of choice and external guidelines in values development continues today in Western education.

The values clarification movement coincided with post-modern relativism, which underpinned teacher education programs that described education as being 'value-free'. Educators were not to allow their personal values to enter the classroom, as students were to construct and clarify their own values. Since that time, educators became aware that "education is neither value-free nor neutral" (Keown, 2005, p. 1). A Values Education Study commissioned by the Australian Government in 2003, found that "schools are not value-free neutral zones of social and educational engagement" (DEST, 2003, p. 12), but that all that was taught in the formal curriculum (and in non-formal and hidden curricula) was based on values. The recommendations of the study resulted in the explicit introduction of values into Australian curricula in 2004, with

the National Framework for Values Education (NFVE), which emphasised the development of a values-based ethos across the whole school, centred around nine key sets of values (DEST, 2005) listed in Appendix 24. It is now broadly accepted in Australian schools that the purpose of values education is both for personal fulfilment and for developing social responsibility, and this is reflected in the intentions for the NFVE (DEST, 2003, p. 10).

As a result of the rapid pace of socio-economic and technological change, education for the first time has had to forecast future trends and prepare all learners equitably "for a type of society which does not yet exist" (Faure, 1972, p. 13), and for jobs that have not yet been created, as the rate of change continues to accelerate and education struggles to keep pace. With rapid forms of transport and communication, educational exchange and influences across countries can be instantaneous, accompanying a demand for freedom and democracy in many countries, both as a result of the "liberating power of education", and leading to changes within education through a democratisation process (Faure, 1972, p. 56). There has also been a growing emphasis on workforce planning and vocational skills for training workers to meet national skill gaps, and for educating professionals to create scientific and technological innovation for economic development purposes. These trends represent a shift in emphasis towards vocational and instrumentalist approaches to education.

Summary

As may be seen from the brief history of the role of values in educational aims summarised in Appendix 5, the relative emphases of education are influenced by cultural differences, socio-political and economic issues, and the needs of the times, with periods of change and modernisation requiring a greater focus on the practical application of scientific and technological knowledge and vocational skills, combined with citizenship education.

Conversely, during times of conflict, perceived moral decline or spiritual renewal, moral education is given greater prominence, particularly where the transmission of traditional culture, values and practices is under threat. This study maintains that today both are needed, blending the practical application of scientific and technological knowledge with an ethical or values base, since technology has the power to alter the environment and quality of life.

In times of crisis or change, the words **'reform'** and **'transform'** have been used to describe the processes needed to bring about change through education. Sterling considered that, "the qualities, depth and extent of learning that take place globally in the next ten to twenty years are critical for the human future" (Sterling, 2001, p. 8). Hence, this study posits that the ability to transform, at personal and societal levels, is required at this point in human history, to change lifestyles, work practices and human interaction sufficiently to sustain the continuity of humanity itself.

It is not new to design education according to the needs of society in a contemporary context. In the seventeenth century, early ideas of access to schooling and basic literacy for all were proposed in Northern Europe and spread to Southern Europe and then to North America in the nineteenth century (Resnick, 2010, p. 1). In the West, over the last 200 years, a focus on basic literacy and later vocational training, sufficient for a primarily agrarian and trade-based economy, gave way to the needs of an industrialising society, developing socially cohesive citizens, competent in the new technologies that led to economic success, while absorbing migrants into the society and workforce. This in turn yielded to the needs of the information and knowledge economy, requiring new skills to access, interpret and manage both the new technologies and the vast amounts of information available. But rather than replace an old set of knowledge and skills with new ones, each new age brought additional skills and knowledge to be

added to the mix (Connell, 1980, pp. 2-16). This eventually led to an overcrowded curriculum and the need to prioritise learning areas and adopt integrated approaches to curriculum development and teaching methods.

In addition to preparing learners for living and working sustainably, education should focus on the complete development of the whole child, as advocated by Avicenna, Rousseau, Pestalozzi, Montessori, the Faure and Delors reports, and others, building the character, values and qualities of the learner to enable full civic participation, innovation and action for positive change. In this way, education can contribute to developing the kind of society needed to address current and future socio-cultural, environmental, and economic challenges.

Dewey argued that the aims of education must be an "outgrowth of existing conditions … based on a consideration of what is already going on … *flexible*; … capable of alteration to meet circumstances", and able to be used to "change conditions" (Dewey, 1916, pp. 104-105). He maintained that an individual approach to moral development formed habitual dispositions, which were applied naturally to social situations, and could therefore equally be directed to societal well-being as to individual benefit (Dewey, 1916, p. 346-360). Based on Dewey's analysis on the role of moral development in education, it may be concluded that the ability to influence positive societal change requires the moral or ethical development of the learner as part of daily life, tailored to contextual needs.

According to Avicenna, Ibn Khaldūn, Comenius, Dewey, and others, education formed part of living in society and was not an artificial construct, being not so much a preparation for life, but life itself, involving relationships and connectedness in community based on shared values

(Morsy, 1997). Since ESD requires changes in values, attitudes and lifestyles, it is essential to link learning with life in family and community.

The educational issues raised in this study relate to contemporary complex, socio-cultural, environmental and economic challenges, and the transformations needed in education to enable learners to transform personally, and to bring about transformation, for the development of a sustainable society. Central to this task are the acquisition and application of knowledge and skills across multiple disciplines, and particularly values, which are integral to ESD and most likely to be neglected. Towards this end, the process of values development is investigated here, alongside the acquisition and application of relevant knowledge and skills for living sustainably.

Why values education, now?

Values education has been re-emerging as a concern among educators in recent times, partly because of unease about how values are being shaped incidentally by the media and screen-based cultures, but also as a response to the rapidly changing social, environmental and economic context. Educators, scientists such as Sperry, and others, recognised that values were needed for positive change at both local and global levels.

> Human values shape decisions that in turn govern human destiny. (Sperry, 1983, p. 5)

As education had adapted to societal change during the past two centuries, so must it respond now to both old and new challenges, at local and global levels, some of which threaten human survival. This chapter elaborates on the concerns raised in Chapter 1 about values, with clear implications for education.

Effects of globalisation

The International Implementation Scheme for ESD (IIS) stated that, "sustainable development is closely linked to processes of globalisation", since the challenges addressed by sustainable development were global in scope and "relate to the very survival of the planet as the host of human society" (Unesco IIS, 2004, p. 9). With globalisation, advances in education, medicine, science and technology had brought great benefit for some, but the old problems of poverty, illiteracy, hunger, disease, war, over-population, high infant mortality, and advancing urbanisation remained of concern for many, while food stocks and water reserves dwindled as the climate changed.

For less developed nations, economic globalisation and new technologies had exacerbated existing socio-economic inequalities and development imbalances, as human suffering increased. The United Nations Development Programme (UNDP) 2007 Human Development Report cited statistics which showed that the benefits of economic growth were not reaching large parts of the world's population, particularly in the poorest countries that were also the "most vulnerable to the effects of climate change and least prepared to mitigate its impact" (UNDP, 2007, p. 3).

Unesco's Executive Board advocated the "humanizing of globalization" since it was dominated by "economic, financial and market principles" posing significant challenges to peace, security, equity, human rights, linguistic and cultural diversity, environmental sustainability, and democracy (Unesco EB, 2000, p. 1). This theme was picked up by UNDP, which called for a renewed commitment to the values and ethics of universalism expressed in the *UN Declaration of Human Rights* and the *UN Charter*, as the guiding objectives of "globalization with a human face". This would "ensure that globalization works for people, not just for profits" and that

human well-being was the **end**, while markets and economic growth provided the **means** of economic activity, and not vice versa (UNDP, 1999, pp. 2-8).

The Delors Report stated that, "all-out economic growth can no longer be viewed as the ideal way of reconciling material progress with equity", but that "new forms of international co-operation" were needed, involving respect for the human condition and for natural resources (Delors, 1996, p. 15).

UNDP expressed the view that:

> national and global governance have to be reinvented – with human development and equity at their core (based on) common … values, standards and attitudes, and a widely felt sense of responsibility and obligations. (UNDP, 1999, pp. 7-8)

Such a paradigmatic shift in world view could not be achieved without international agreement and cooperation, and the promotion of values through education.

Information and Communication Technology (ICT) has improved global interconnectedness, thereby facilitating international cooperation and understanding through intercultural and knowledge-exchange. ICT facilitates democratic processes and cooperation among Non-Government Organisations (NGOs) and local communities, enabling their voice to be heard at national and international levels, exerting pressure for positive change. Such interdependence calls for shared values as a rallying point and basis for cooperation. Unfortunately, these technologies have also promoted inequalities, causing a growing digital divide, rapid loss of linguistic and cultural diversity, and rising racial, social and religious tensions that threaten security.

It seems that the all-pervasive effects of globalisation will continue, and that no-one is immune from its effects, affecting every area of life at all levels, from the personal to the local and the global, impacting on the type of education needed to address them.   The challenge is to transform existing values, mindsets and systems of thinking, lifestyles, work-styles and actions, for a balanced and equitable sharing of the benefits, while minimising the negative impacts of globalisation and diminishing their destructive ecological consequences.

Peace and Human Rights

In the areas of peace, intercultural and interfaith understanding, and harmonious human relations, the situation is also bleak. The annual report of the Uppsala University Conflict Data Program found that the number of conflicts around the world was on the rise again and that they were more intractable and drawn out in nature than previously (Harbom, 2006). According to Saul, over 75 million had died over a period of 35 years, with 50 conflicts being fought concurrently around the world (Saul, 1997, p. 11).

Other problems have also worsened, such as organised crime and violence on an international scale, global terrorism, increasing intra-State and inter-religious conflicts, threatening peace, security, and human rights, causing the displacement of growing numbers of refugees. While the increase in the number of countries that have adopted democracy over the past 50 years is unprecedented, there are very high levels of internal conflict and instability in many countries during the transition period, and some have reverted to undemocratic regimes.

The 2007 report by Amnesty International (AI) of the state of human rights in the world revealed that "heightened fears about terrorism and insecurity have reinforced repression" indicating the role of fear in compromising values, as "fear destroys our shared understanding and our shared

humanity" (AI, 2007, p. 6). When a threat was perceived, human rights were compromised for security. Examples in the AI report of human rights violations around the world included references to Australia's treatment of asylum seekers in desperate circumstances, and low rates of prosecution for violence against women. The report saw shared values as providing the only sustainable solution for moving away from fear-based responses:

> Only a common commitment based on shared values can lead to a sustainable solution … global values of human rights … bring people together and promote our collective well-being. (A.I. 2007, p. 2)

Environmental degradation

The Earth is experiencing severe environmental degradation, biodiversity loss and climate change, caused by the excessive burning of fossil fuels for transport and industry, leading to food and water shortages, rising sea levels, increasing natural disasters and the threat of pandemic, while the global economic system depends on continual growth to avoid collapse.

> The unfortunate reality is that the economy continues to expand, but the ecosystem on which it depends does not, creating an increasingly stressed relationship. (Unesco IIS, 2004, p. 8)

UNDP's 2008 Human Development Report found that, although climate change ultimately threatened all of humanity, the world's poorest citizens were the most vulnerable, as the world drifted towards a 'tipping point' that could leave hundreds of millions facing malnutrition, water scarcity, ecological threats, and a loss of livelihood (UNDP, 2008). Some climate scientists maintained that a number of climate change 'tipping points' had already been reached (National Geographic News, 2007), the UNDP report therefore called for prompt collective action based on shared values, since allowing the window of opportunity for action to close would represent a moral and political failure without precedent in human history (UNDP, 2008, p. 2).

The Australian context

Although severe inequities exist in the developing world, the UNDP 2007 report showed that inequities also occurred within economically developed nations, since the advance and impacts of globalisation were neither uniform throughout the world nor within countries.

> The gap between rich and poor citizens, within both developed and developing nations, is also growing. (UNDP, 2007, p. 2)

In a leading economy such as Australia, there are growing socio-economic and educational gaps, increasing poverty, homelessness, domestic violence and abuse, intercultural conflicts, and erosion of democracy and human rights, most evident in the detention of child asylum seekers. In addition, evidence of environmental degradation and climate change abound, with rapid species loss, drought, flood, crop failure, water shortages and more frequent devastating fires. There is also a general malaise among young people, evident in high levels of depression, suicide and substance abuse. The complexities and demands of modern life require the development of resilience in youth based on internalised values that guide choices and actions throughout life.

In comparing Australia with OECD nations, the UNDP 2007-2008 Human Development Report found that, while Australia's economic growth was above the OECD average and was ranked very high on the UNDP high Human Development Index (HDI), Australia ranked thirteenth on the UNDP 2007 (HPI) Human Poverty Index (UNDP, 2008, pp. 241-242). These figures demonstrated a growing gap between rich and poor in Australia, revealing a greater emphasis on economic growth at the cost of human well-being, and the erosion of values in a nation once proud of the Australian tradition of "mateship, egalitarianism and the fair go" (Mackay, 2007, p. 157).

The national attitudinal surveys conducted by Mackay, revealed that mainstream Australian values became more about pragmatism and materialism than equity (Mackay, 2007, p. 158), but also found "a dramatic surge in interest in values" (Mackay, 2007, p. 279). Respondents felt that they were not living in harmony with the values they espoused (Mackay, 2007, p. 279), and yearned for greater "moral clarity" in the face of uncertainty, while seeking "to match their values to their reality" (Mackay, 2007, pp. 284-285). A greater focus on values is needed now more than ever, in a nation that emits more carbon emissions per capita than any other country in the world.

Youth explore values to search for meaning and make sense of their life, connecting to others, to nature, or to something larger, such as social justice. This provides a sense of order and coherence (Kessler, 2000, pp. 58-59), which Hill considered to be central to the role of schooling:

> … the individual's search for personal meaning and significance, far from being peripheral to the school's task, is central. (Hill, 2004, p. 12)

McGettrick also linked the formation of values with service learning (McGettrick, 1995, p. 2), often involving civic contribution and caring for the local environment.

Summary

To shift the global economy towards environmental sustainability and human well-being would require significant structural change, supported by education systems that promote the underlying global values for humanising economies, in ways that are ethical, responsible, caring and just. The requisite global values already exist in numerous international agreements providing the basis for living together peacefully, equitably, humanely and sustainably, without subsuming individual personal, cultural, religious or local values. It is possible for these to co-

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exist and complement each other, acknowledging that respect for diversity is a global value that is central to ESD.

In addition to structural and organisational change, deeper levels of personal and collective attitudinal and values shifts are required for lifestyle and workplace changes to occur. The 1999 UNDP report concluded that the "pressures of global competition are squeezing out care, the invisible heart of human development" needed for social cohesion and "nurturing human relationships with love, altruism, reciprocity and trust" (UNDP, 1999 p. 7). The IIS affirmed the importance of relationships for sustainable development, recognising the human element as the "key variable" (Unesco IIS, 2004, p. 14).

But caring is not enough. It is necessary also to inquire critically into the type of society being created by the policies, plans and actions taken by governments and corporations, and the values reflected in these, and to have the skills to take appropriate, collective, civic action. The pervasive influence of the media and communication technologies also requires learners to develop critical literacy based on a solid, internalised, values framework, to help make sense of the screen-based ideas and images to which they are constantly exposed.

Education needs to do more than emphasise the basics for functional or vocational outcomes directed towards national economic and material benefit. The social, cultural and environmental outcomes of an education in values are vital for developing citizens, workers and leaders equipped to make decisions on the basis of long-term ethical, rather than short-term material, considerations.

The response of education to global challenges

During the last few decades, a widespread consensus has emerged about the type of education based on values, needed to address shared challenges, expressed in numerous international documents.

International call for education in values

The Convention on the Rights of the Child went beyond instrumental goals for education and included the socio-emotional, cultural and creative aspects of education to benefit the child as well as society. It fostered the development of responsibility, understanding, peace, tolerance, and friendship among peoples, respect for human rights, freedoms and equality, for the child's culture, language and heritage, and for the natural environment (OHCHR, 1990, Article 29), all of which reflected values that are central to sustainable development. The 1990 World Declaration on 'Education for All', defined "basic learning needs" as the "knowledge, skills, values, and attitudes" required for human survival (WCEFA, 1990, p. 11); a focus that was reiterated in the 2000 Dakar Framework on 'Education for All' (Unesco Dakar, 2000).

Many documents from the global interfaith movement also called for values education to address sustainability. The 1993 Statement of the Parliament of the World's Religions, *Declaration Toward a Global Ethic,* signed by more than 200 religious leaders from over 40 different faith traditions and spiritual communities, affirmed that a common set of core values existed in religious teachings. It called for a transformation of consciousness through values and ethics in the areas of peace, economics, ecology and human rights (CPWR, 1993). The 1999 Conference of the Parliament of the World's Religions called for education to give attention to "learning about values … (for) a peaceful and harmonious life" (CPWR, 1999, p. 30). Education was to "teach respect for other ways of life, non-violence, and peace-making … (and) promote

ecological literacy and the study of sustainability" emphasising "values, personal responsibility, moral integrity, and community service" (CPWR, 1999, p. 31). The 1996 Delors report also stressed the importance of 'spiritual' and 'moral' values, highlighting "education's noble task to encourage … (individuals) to lift their minds and spirits to the plane of the universal and … to transcend themselves" (Delors, 1996, p. 18).

The *Earth Charter* called for the integration in education of global values of respect, responsibility, social and economic justice, democratic participation, freedom, peace, care, understanding, compassion, interdependence, tolerance, and non-violence that were "needed for a sustainable way of life … to support the long-term flourishing of Earth's human and ecological communities" (ECI, 2000).

In 2000, the Unesco Executive Board called for education systems to give priority to intercultural education and citizenship education programs to promote social cohesion, mutual understanding and peace, by emphasising core values such as respect, pluralism, human rights, tolerance, participatory democracy, equality of opportunity and justice (Unesco EB, 2000, p. 4). The 2001 International Conference of Ministers of Education (ICE) responded to disturbing global trends by emphasising the need for education in the shared values associated with citizenship, democracy, peace, human rights, economic and ecological sustainability, cultural and linguistic diversity, social cohesion, understanding, and for addressing ethical issues and moral dilemmas (IBE, 2001).

A communiqué issued by Unesco's 2003 Ministerial Round Table on Quality Education defined quality education as "equipping all children with universally shared ethical and moral values, for them to learn and practice the values of empathy, compassion, honesty, integrity, non-violence

and respect for diversities" (Pigozzi, 2004, pp. 146-148). The IIS described ESD as being

"fundamentally about values, with respect at the centre" (Unesco IIS, 2004, p. 4). Education was

seen as the "primary agent of transformation towards sustainable development", building the

capacity for "futures-oriented thinking", long-term decision making, and the "responsibility to

effect positive change on a global scale" for the "equity, economy and ecology of all

communities" (Unesco IIS, 2004, p. 15). The World Programme on Human Rights Education

(WPHRE) advocated the development of the "values, attitudes and behaviour … which uphold

human rights" (OHCHR, 2006, p. 4), stating that a "rights-based quality education encompasses

the concept of education for sustainable development … (and addresses) ethical issues such as

human values" (OHCHR, 2006, p. 6). The values identified in these documents were aspirational

and forward looking, but reflected common issues and concerns. Collectively they shared the

call for the **explicit** inclusion in education of values for a peaceful, just and sustainable world:

> the shared values and principles underpinning sustainable development … (must be)
> made explicit. (Unesco IIS, 2004, p. 16)

The Delors Report

The 1996 Delors Report was one of the most influential international documents to guide

education policy and implementation in recent times, providing a practical framework based on

four interconnected pillars of learning, namely: 'learning to know', 'learning to do', 'learning to

be', and 'learning to live together'. It was proposed that the framework would contribute to both

personal and social development, and build rapport among peoples, to attain the ideals of equity,

human rights and peace (Delors, 1996).

The first three pillars were reminiscent of Pestalozzi's 'head, heart and hand' framework (Morsy,

1997, Vol. 4, pp. 423-435). The 'head' correlated with 'learning to know', referring to cognitive

processes of knowing, thinking and learning how to learn throughout life. The 'heart' correlated

with 'learning to be', referring to the affective processes of being, feeling and valuing to enable the learner to reach full creative potential. The 'hand' correlated with 'learning to do', referring to practical and functional skills development for doing, creating, implementing and taking action. Sterling added 'spirit' to the head-heart-hand trilogy, proposing an education that sustained the "whole person – spirit, heart, head and hands" (Sterling, 2001, p. 8), which was also reflected in the Delors report with reference to "spiritual values" (Delors, 1996, p. 22).

The Delors report considered the fourth pillar, 'learning to live together', to provide the "foundations of education", encompassing the other three pillars, which provided the "bases for learning to live together" (Delors, 1996, p. 23). The fourth pillar therefore involved all three learning processes of 'head, heart and hand', requiring: (a) self-knowledge and knowledge about other cultures; (b) values of respect for others; and (c) skills for communicating peacefully and resolving conflict (Delors, 1996, p. 22), all of which are important to ESD. There is a reciprocal interaction between the 'learning to be' and 'learning to live together' pillars, since self-knowledge enables a better understanding and appreciation of others, while knowledge and understanding of others leads to enhanced self-understanding. The report lamented that the latter two pillars were "left to chance" while the first two, 'learning to know' and 'learning to do', were traditionally emphasised by formal education, hence recommending that each be given equal attention (Delors, 1996, p. 86).

Environmental sustainability has become pressing, since the publication of the Delors report in 1996, as have the interdependent areas of peace, equity, justice, and human rights, now unified in the ESD framework. The changing global context necessitates an expansion in scope of the four pillars, adapted to the requirements of ESD in local contexts linked to global issues. For

example, the scope of the fourth pillar, 'learning to live together', can be expanded to include learning to share the world's resources in peaceful, equitable and sustainable ways.

The characteristics of the four Unesco pillars of learning are summarised in Appendix 6, and although the pillars appear separately in the table, they actually overlap and interconnect, as learners constantly undertake complex simultaneous functions. Knowledge and meaning are continually constructed and reconstructed, as insights are gained, senses are engaged, experiences and perceptions acquired, skills learned and action taken, all the while spurred by emotional responses. The interdependence of the four pillars suits them well for integrated and trans-disciplinary approaches to ESD.

> The four pillars of learning … support and interpenetrate one another and should therefore be applied as basic principles, cross-cutting themes and generic competences for integration in and across subject areas or learning domains. (Nanzhao, 2005, p. 3)

Since the IIS called for both personal and societal transformation, Shaeffer called for a fifth pillar of learning; 'learning to transform' to prepare learners to "transform society … change the world … and live sustainably" (Shaeffer, 2006, p. 19). Together the five pillars could implement ESD to bring about personal and systemic change, leading ultimately to societal transformation and sustainability.

Although different world views necessarily shape the kind of education that is culturally appropriate in each context, the effects of globalisation, science, technology and climate change are shared by all, requiring similar values and skills for ESD throughout the world. What may differ are the relative emphases, institutional and curricular structures, teaching methods employed, and the local knowledge specific to the socio-political, cultural and geographic situation. The diversity of cultural traditions and ways of 'knowing', 'being' and 'doing' that

comprise humanity's rich heritage, offer opportunities for mutual synergistic exchange and learning between cultures.

The Delors Report identified 'seven tensions' to be overcome for education to address current and emerging global challenges, by developing the skills, values and understandings to facilitate their peaceful and creative resolution (Delors, 1996, pp. 17-18). The IIS described ESD as seeking to nurture the confidence, critical thinking and creative problem solving skills for addressing the dilemmas and challenges of sustainable development (Unesco IIS, 2004, p. 5), as encapsulated in the seven tensions, which are described in Appendix 7.

In addition to the ever-present need to raise standards of literacy and numeracy, education needs to address ten challenges to prepare learners for a sustainable society. A summary of how education might respond to these challenges is contained in Appendix 8, all of which contain a values dimension. The number and breadth of challenges are likely to increase as unanticipated issues emerge with climate change and continually advancing science and technologies, highlighting the need to rethink education continually, integrating change as it occurs. Since the time gap between schooling and application in life and in the workforce is too long for current rapid rates of change, education must prepare learners with the knowledge, values and skills to learn and adapt continually throughout life, with clear implications for pre-service and in-service teacher education.

Education is often charged with the task of implementing the ideals and aspirations for the kind of person and the type of society that the community wishes to nurture, underpinned by values and principles, expressed in strategic aims, goals and objectives, which are then translated into policy, action plans, and curriculum documents. However, the vision and the rhetoric expressed

in these documents are not always reflected in practice, while innovative practice may at times go beyond what is required.

> Learning almost never seems to be what it is intended to be by those … who attempt to create the conditions for its emergence. (Visser, 1999, p. 6)

The challenge for educators is to reconcile the conflict between values advocated and those enacted, and those of diverse cultures, the media, the broader community, and its leaders.

Conclusion

In a society where values are both implicit and explicit, teachers and learners need to be aware of how their own and others' values influence their thinking, choices and actions. Although not a panacea for all ills, values education can offset negative influences, by skills of discernment and questioning, and by modelling and promoting values and behaviours that are conducive to positive and constructive relationships and behaviours at school, in the family, and in society.

In addition to the renewed importance of the enduring values advocated in previous times, this study examines the processes for integrating a set of universally shared global values into education, relevant to current local and world contexts, which prepare the whole person to contribute to positive societal change, while respecting differences in individual and cultural values. In a rapidly changing and globalised world, education is faced with the challenge of reconciling tensions between local, national and cultural values with shared global values for a sustainable society, through learning processes that occur at both individual and collective levels. Although challenging, much progress has already been made both in Australia and elsewhere. Recent initiatives promoting values education in Australia, which may readily be applied to ESD, are discussed in the next chapter.

CHAPTER 5:   **VALUES IN AUSTRALIAN SCHOOLING**

Introduction

This chapter provides a background to the teaching and learning of values in Australian

education, both in general terms and as they relate to Education for Sustainable Development

(ESD), demonstrating that considerable work has already occurred to integrate values into

Australian schooling. Subsequent chapters investigate the extent to which the emerging

Australian National Curriculum builds upon this work.

Although the various Australian State, Territory, Catholic and Independent education authorities

had for some decades established separate corporate values to guide educational strategic

directions, values were not explicitly stated in respective curriculum frameworks. Values have

been expressed in the National Goals for Schooling since 1989, and to some extent in the

National Statements of Learning for each learning area, but it was not until the National

Framework for Values Education in Australian Schooling (NFVE) was established by the

Federal Government in 2004 that values were systematically and explicitly integrated in

Australian education.

Nonetheless, values related to ESD had been implicit in Australian schooling since the 1960s,

particularly in subjects such as Social Studies, later called Studies of Society and Environment

(SOSE), and in cross-curriculum areas, such as multicultural and indigenous education,

development and global education, civics and citizenship education, peace, human rights and

environmental education. More recent developments in Education for Sustainability (EfS) and in

Global Education, revealed a convergence of values-based educational areas that correlated more

closely with ESD.

The distinction made by Halstead and Taylor (1996) between 'values in education' and 'education in values' discussed in Chapter 4, is retained in this chapter and discussed in relation to values in Australian schooling, while acknowledging their interrelationship.

Values in education in Australia

Values inform Australian schooling in a number of ways. First, there are values expressed in the nationally agreed goals for Australian schooling, which guided educational directions nationally, informed the development of state-based curriculum frameworks, and characterised the general ethos of educational administration and school management. Second, States and Territories each developed separate corporate and governing principles to underpin educational activity. Third, individual school communities, negotiated values relevant to the local context, linked to national and state values for schooling.

Although the values at national, state and local levels overlapped and duplicated one another, there were differences in emphasis and priority that reflected the issues faced in each community. For example: (a) culturally diverse communities emphasised cultural respect and valuing diversity; (b) Indigenous schools emphasised the strengthening of language, cultural heritage and identity; (c) schools close to wilderness areas and national parks emphasised environmental protection and sustainability; (d) communities with high levels of crime and vandalism emphasised safety, school pride and responsibility; and (e) schools that experienced problems with bullying among students emphasised mutual respect, care, empathy and resilience. In most cases, schools reflected a mix of these values. The different emphases on values were often negotiated across the school community thereby strengthening relationships for the well-being of learners.

Values in the National Goals for Schooling

National statements of goals for Australian schooling were co-signed by the Australian Education Ministers in 1989, 1999 and 2008, containing both implicit and explicit value statements.

The first statement was *The Hobart Declaration on Schooling,* which included some global values such as 'respect', 'equality' and concern for "balanced development and the global environment" (AEC, 1989), and a general focus on Australian democratic values, while acknowledging the global context:

> … exercise judgement in matters of morality, ethics and social justice … attitudes and values … to participate as active and informed citizens in our democratic Australian society within an international context. (AEC, 1989)

The Adelaide Declaration on the National Goals for Schooling was issued in 1999 as the basis for the development of *National Statements of Learning* and State and Territory curriculum frameworks. The Adelaide Declaration stated that schooling was to provide the foundation for the **all-round development** of learners, including their moral and spiritual development, building on the earlier declaration but with significant additions, such as: (a) valuing diversity and reconciliation with Indigenous peoples; (b) the ability to deal with complex environmental and social challenges; and (c) contributing to ecologically sustainable development (MCEETYA, 1999).

The Melbourne Declaration on Educational Goals for Young Australians was released in 2008 with a broader frame of reference, owing to the significant societal, environmental and technological changes that had occurred since 1999, with the twin objectives of: (a) promoting equity and excellence, and (b) fostering successful learners, confident and creative individuals,

and active and informed citizens. The Melbourne Declaration also revised the learning areas that were to inform the new national curriculum (MCEECDYA, 2008).

The values expressed in the three declarations are collated in Appendix 9 for comparing the shifts in values that occurred between 1989 and 2008. A consistent focus is evident across all three declarations on equity, social justice, self-esteem, confidence, optimism, health, creativity, environmental concern, moral judgement, cultural respect and social justice. But an expanding range and number of value-laden concepts are found progressively across the three documents, accompanied by an increasing emphasis on the following groups of values: (a) quality, excellence and success; (b) partnerships, cooperation and teamwork; (c) whole person development, quality of life and well-being; (d) economic prosperity, productivity, enterprise and competing globally; (e) valuing and respect for social, cultural, linguistic and religious diversity, including Indigenous cultures; and (f) civic participation, democracy, working for the common good, collective responsibility, and the introduction of global citizenship into the 2008 document. While the 1999 document included the provision of a supportive, nurturing environment for learners, this was not evident in the 2008 Melbourne Declaration. Overall, there was an expanding range of values relevant to ESD over the period.

Values in Australian State and Territory educational jurisdictions

Australian State and Territory public education authorities included values in corporate documents, such as strategic plans and teacher guidelines. These values informed key priorities, and provided a framework to inform the educational ethos, and guide schools in the values to be reflected in school policies, practices and programs, reinforced through school-wide modelling. Nonetheless, values had remained implicit in state-based curricula until the development of the

National Framework for Values Education in Australian Schools (NFVE) in 2004, after which values were systematically mapped to curricular learning outcomes.

The various values frameworks found at the time of writing in respective educational jurisdictions are collated in Appendix 10, for comparing values across States and Territories. These show that public education was not valueless, and that it reflected societal values, even if not clearly articulated nor explicitly expressed in curricula. The values that appeared most frequently across jurisdictions were: 'excellence', 'respect', 'equity' or 'fairness', 'cooperation', 'honesty' or 'integrity', and to a lesser extent, 'responsibility' and 'care', all of which were relevant to ESD.

Worth noting were the values in the Western Australian framework developed in the mid-1990s, which consisted of five value clusters grouped in two categories, namely 'protective values' concerning the rights of individuals, and 'purposive values' representing shared or community goals (Reynolds, 2001, p. 23). These acknowledged the importance of both individual and communal values thereby reconciling differences between Eastern and Western orientations. Hill argued that these value categories were needed since "technical values associated with economic rationalism were inadequate to keep the peace and maintain social structures" (Reynolds, 2001, p. 23). The five value clusters, which related closely to ESD, were: (a) a pursuit of knowledge and a commitment to achieving potential; (b) self-acceptance and self-respect; (c) respect and concern for others and their rights; (d) social and civic responsibility; and (e) environmental responsibility, including cultural heritage, environmental conservation, sustainable development and species diversity (CCWA, 2005, p. 3).

Kiernan (2005) comprehensively mapped the values from the NFVE against the values underpinning the Tasmanian Essential Learnings (TELS) to enable the integration of both national and state values in teaching practice. The mapping demonstrated a strong sustainability focus, since sustainability was a cross-curricular area in the TELS.

The Victorian curriculum framework included 'values', 'sustainability', 'human rights', 'indigenous perspectives', and 'multiculturalism' as cross-curricular perspectives requiring a whole school approach (VCAA, 2005). The cross-curricular perspective adopted an integrated systems approach, involving an understanding of the interaction between social, environmental and economic systems, consistent with the recommendations of the International Implementation Scheme (IIS) for ESD, mapped comprehensively against the Victorian curriculum standards (VCAA, 2005). The introduction of sustainability as a cross-curricular perspective in Victoria, preceded the later decision to include sustainability as a cross-curriculum priority in the Australian National Curriculum, discussed in later chapters. Overall, the State and Territory values listed in Appendix 10 compared favourably to the values contained in the NFVE, which however, did not contain the value of 'co-operation', nor a sustainability focus.

Education in values in Australia

The *National Framework for Values Education in Australian Schools* (NFVE), established by the Australian Federal Government in 2004, represented the first time that values were systematically and explicitly integrated in education nationally, to inform both school management and curricula in a whole school approach to values, thereby linking values in education with education in values.

The National Framework for Values Education in Australian Schools

Following a discussion by Ministers of Education during a Ministerial Council (MCEETYA) meeting, a Values Education Study was commissioned in 2003, together with a schools grants program, to examine how values might be fostered effectively in Australian schools. Ministers acknowledged that "education is as much about building character" as it is about acquiring knowledge and skills (DEST, 2005, p. 1). The grants program enabled schools to develop exemplary practice in values education in the areas of: (a) learner personal and social development and behaviour management, (b) integrating values across the curriculum, and (c) developing values as a whole school community. The final report of the Values Education Study confirmed that schools were not value free, and recommended a draft framework of values and principles to guide school implementation (DEST, 2003).

The NFVE was subsequently launched in 2004, with the following nine value sets: (a) care and compassion, (b) integrity, (c) doing your best, (d) respect, (e) fair go, (f) responsibility, (g) freedom, (h) understanding, tolerance and inclusion, and (i) honesty and trustworthiness, which were considered to be consistent with Australian democratic values (DEST, 2005, p. 4).

Schools then strove to reconcile the NFVE values with those of their respective education authority, and with the shared values relevant to their school community. In Tasmania, for example, the values in the NFVE were mapped with those in their curriculum framework to assist teachers with implementation (Kiernan, 2005). In order to facilitate curricular integration, the values in the NFVE were divided into 11 domains, with the individual as the central focus: (a) interpersonal-relational, (b) socio-cultural, (c) political-civic, (d) religious-spiritual, (e) ethical-moral, (f) cognitive-intellectual, (g) technical-vocational, (h) economic, (i) educational, (j) physical-recreational, and (k) aesthetic (Commonwealth of Australia, 2005, p. 6). The

environmental domain was absent, but was implied in the value of 'responsibility'. Nonetheless, environmental concerns were weak in the framework, despite being present in the 1999 and 2008 National Goals for Australian Schooling. The individualistic focus of the 2005 domains was followed by a shift in the 2008 National Goals for Schooling towards connection with communities, civic participation and working for the common good (MCEECDYA, 2008). The themes addressed by schools involved in the Values Education Study informed the NFVE vision for schools to: (a) consult with the whole school community in identifying shared values, to be applied in the school's ethos, policies, teaching practices, and across the curriculum, and (b) develop student resilience, character, responsibility and social skills, in a safe and supportive learning environment (DEST, 2005, p. 3), thereby strengthening whole school approaches to values education.

Quality criteria for good practice values education in Australian schooling

The NFVE also provided a set of guiding principles for good practice in values education, listed in Appendix 11 (DEST, 2005, pp. 5-7), which were implemented and built upon by the 51 school clusters participating in the two-stage Values Education Good Practice Schools Project (VEGPSP). The final reports for each stage of the VEGPSP recorded the good practice that emerged among 309 schools involving over 150,000 students, across a range of values education projects conducted between 2005 and 2008 (Commonwealth of Australia, 2006 and 2008).

The VEGPSP case studies demonstrated how values education might be carried out in a planned and systematic way, to become a core part of schooling. The VEGPSP Stage 1 report concluded that good practice in values education fostered the development of strong positive relationships among students, and teachers. For teachers, values education increased levels of confidence and professional fulfilment. For students, it increased capacity for reflection, caring, respect and

friendliness, and produced calmer, more harmonious and more focused classroom activity, enabling learners to manage themselves better (Commonwealth of Australia, 2006, pp. 2-13). Values-based learning promoted intellectual depth, reflection, self-management and self-knowledge, "the very hallmarks of quality teaching" (Commonwealth of Australia, 2006, p. 17).

The key findings from VEGPSP Stage 1 led to ten recommendations for good practice in values education, also listed in Appendix 11, which included involving the whole school community in reaching agreement about the values guiding the overall school ethos (Commonwealth of Australia, 2006, pp. 2-4). The greatest success occurred when the agreed values were articulated explicitly, taught, modelled, reinforced positively and practised on a daily basis, and embedded within existing policies, teaching practices and curricula. The development of supportive learning environments, and positive relationships between students, teachers and parents, were central to values education, as they fostered student social skills, responsibility and resilience (Commonwealth of Australia, 2006, pp. 2-4).

The Stage 2 VEGPSP projects, which implemented values education across learning areas, and focused on intercultural and global concerns (Commonwealth of Australia, 2008, p. 6), supported and further refined the principles of good practice expressed in the NFVE, and in the Stage 1 VEGPSP recommendations. In particular, these related to: (a) whole school approaches, (b) leadership, (c) explicit teaching and modelling of values, (d) integration across the curriculum, and (e) teacher professional learning (Commonwealth of Australia, 2008, pp. 8-9), and are listed in Appendix 11.

The revised good practice principles recommended the use of pedagogies that were values-focused, student-centred, and deeply engaging, which fostered learner empowerment and student

agency through whole person development (i.e. heart, mind and actions). The principles also broadened to encompass local and global contexts, and to foster intercultural and interfaith understanding, social cohesion and social inclusion, representing a significant step towards developing a comprehensive integrated approach to values education applicable to ESD.

The good practice principles for quality values education, contained in the NFVE and that emerged from the two VEGPSP projects, are synthesised and listed in Appendix 12 alongside the characteristics of a quality approach to ESD described in the IIS, and other values-based frameworks discussed later in this chapter. A comparison reveals the following similar features between the VEGPSP and the IIS: (a) the explicit integration of values across the curriculum, (b) the adoption of whole school approaches, (c) the focus on partnerships, (d) the need for local and global relevance, and (e) the use of varied quality teaching strategies and methods. The VEGPSP found that the most effective learning experiences were "values-explicit, student-centred and open-ended", in a safe learning environment, in which learners engaged in personal reflection, and took action in real-life situations. These led to positive changes for the students, teachers and the school community (Commonwealth of Australia, 2008, p. 29). The VEGPSP revealed that sustained and deep values learning required "particular types of teaching and learning strategies, where the values taught are the values practised in the pedagogies themselves" (Commonwealth of Australia, 2008, p. 30). The most effective values education methods described in the case studies were: (a) learner-centred, (b) explicit, (c) inclusive, respectful and reflective, (d) open-ended, (e) involving relevant real-life experiences and action, and (f) fostering empowerment and responsibility (Commonwealth of Australia, 2008, p. 30).

Most VEGPSP Stage 1 projects emphasised social and relational development to foster more positive behaviours and improve learning outcomes, with few examples that focused on

sustainability. However by 2007, a concern for contemporary issues became evident in the Stage 2 projects, through values such as responsibility, respect and care, and themes such as environmental and social sustainability, social harmony, intercultural and interfaith understanding, and building better communities (Commonwealth of Australia, 2008, p. 39). However, some clusters "took a more narrow environmental education perspective of sustainability to shape their values program" (Commonwealth of Australia, 2008, p. 40), with little evidence of an integrated approach to the social, environmental and economic dimensions of sustainability. Nonetheless, the NFVE and the VEGPSP projects systematically established formal values education in Australian schools for the first time, producing many examples of good practice that were integrated with other values-based educational activities or programs relevant to ESD. The values education work complemented the implementation of education for sustainability (EfS) through the Australian Sustainable Schools Initiative (AuSSI).

Evolution of Education for Sustainability (EfS) in Australia

The term 'Education for Sustainable Development' (ESD) is not commonly used among educators in Australia, except in some documents discussing links between Australian and international initiatives, or when referring to ecologically sustainable development, which is limited to environmental concerns (Commonwealth of Australia, 2000, p. 3). The preferred term in Australia is 'Education for Sustainability' (EfS), in which socio-economic development is de-emphasised, and the focus is primarily environmental. The term 'sustainable schools', refers to schools that implement whole school approaches to EfS. Education for a Sustainable Future (ESF) is another term used in some documents with a futures focus that preceded the emergence of EfS.

As elsewhere, EfS in Australia developed from Environmental Education (EE), which had been part of Australian schooling since the early 1970s, and was initially linked with nature science as it "sought to develop knowledge about the environment" (DEH, 2005, p. 2). Following the coining of the term 'sustainable development' in the 1987 Brundtland Report, the transition towards ESD at the international level influenced the evolution of EfS in Australia, moving from a focus on the degradation of natural ecosystems, to knowledge, values and skills development for responsible decision making and empowered action (Commonwealth of Australia, 2009a, p.4).

The term 'sustainability' made its way into the first National Action Plan on *Environmental Education for a Sustainable Future* (ESF) in 2000, in which EE was defined as developing knowledge, values and skills, to change behaviour for an **ecologically** sustainable environment (Commonwealth of Australia, 2000, p. 3). Although EE was to be holistic, make systems connections, and harmonise with social and economic goals like ESD (Commonwealth of Australia, 2000, pp. 3-4), practice was slow to follow. The 2005 National Environmental Education Statement for Australian Schools, *Educating for a Sustainable Future,* cited the UN Decade of Education for Sustainable Development in its introduction, and described the themes of EfS as being multidimensional (i.e. social, political, ecological and economic), but the focus was actually **environmental** (DEH, 2005, pp. 16-17). The 2008 Unesco report, *ESD On the Move*, found that in Australia "environmental issues still dominate ESD thinking, (which) needs to be changed … if ESD is to achieve the transformative impact that is its objective" (Unesco Bangkok, 2008, p. 2). The report acknowledged the need for ESD to be extended beyond ecologically sustainable development to include "cultural sustainability, economic vitality, social equity, well-being, and active citizenship" (Unesco Bangkok, 2008, p. 6).

Henderson (2004, pp. 7-8) clarified the difference between EE and EfS, as being a shift from learning **about** and protecting the environment through experiences in nature (i.e. what), to learning **for** sustainability by engaging in critical reflection of lifestyles and making informed decisions and changes (i.e. how). This involved schools shifting from **what** to teach, to developing the **context** in which teachers, students and the community learnt together about "complex social issues, such as the links between environmental quality, human equality, human rights and peace", involving critical inquiry, systems thinking and skills for participation, action and partnership (Henderson, 2004, p. 8).

The 2000 National Action Plan for EE was revised along these lines in 2009 with an EfS action plan, *Living Sustainably*, which aligned with ESD principles of: (a) transformation and change, (b) systems thinking, (c) critical thinking, (d) participation, and (e) partnerships for change (Commonwealth of Australia, 2009a, p. 9), but which continued to focus mostly on environmental issues such as "climate change, water security and pollution" (Commonwealth of Australia, 2009a, pp. 3-4). Despite the rhetoric in Australian documents, actual practice in schools has been slow to integrate social, cultural and economic dimensions of ESD, with the focus remaining primarily environmental. Examples of socio-economic and socio-cultural dimensions in EfS have been sporadic, and notions of development have been addressed mostly through global education topics and not through EfS (DEWHA, 2010).

Australian Sustainable Schools Initiative (AuSSI)

Since 2002, schools participating in the Australian Sustainable Schools Initiative (AuSSI) engaged the community in whole school approaches to sustainability, by improving school management of resources, grounds and facilities, leading to significant reductions in water and power consumption.

'Sustainable Schools' integrated sustainability principles and practices across school operations and the curriculum, and provided practical sustainability experiences based on partnerships (DEH, 2005, p. 10). Approximately 25 per cent of all schools, mostly at the primary school level, participated in AuSSI, also influencing families and communities, as children transferred learning to their home and community context. The significant distinguishing features of Sustainable Schools were the: (a) whole school approach, (b) community engagement and partnerships, and (c) student leadership and empowerment for decision making, problem solving and taking action towards sustainability (DEWHA, 2010).

Initially ecological practices typically addressed included: (a) improving school grounds, (b) bush regeneration, (c) biodiversity, (d) water conservation, (e) solar heating, (f) litter and waste reduction, (g) energy saving, and (h) recycling (DEH, 2006, p. 33). Later additions to AuSSI initiatives broadened to include: understanding society to maintain a healthy, just and sustainable lifestyle, including how culture shaped society, relationships with others, their environment, and their social, economic and political systems, and taking positive action (DEWHA, 2010). The scope of topics initially addressed in AuSSI schools is listed in Column A in Appendix 13, and the topics added later are listed in Column B of Appendix 13, which linked with Studies of Society and Environment (SOSE), and with other areas such as global education, civics and citizenship, multicultural and Indigenous education, peace, human rights and health education.

A comparative assessment of 16 AuSSI pilot school programs conducted in 2006 reported significant educational benefits for students, and social benefits for the whole school community, which are listed in Appendix 14. Despite these benefits, sustainability was defined in the

assessment in environmental terms, without reference to social or economic issues (DEH, 2006, p. 36).

AuSSI and whole school approaches to Education for Sustainability (EfS)

A wide range of resources have been developed to support Sustainable Schools to take a whole school approach to EfS, including: (a) planning and implementation checklists, (b) case studies, (c) sample curricula, (d) templates for developing a School Environment Management Plan (SEMP), (e) processes for engaging the whole school community, and (f) calculation tools for conducting environmental audits and measuring resource use and ecological footprints (DEWHA, 2010).

Among these resources were the implementation frameworks and guides for sustainable schools developed by each State. The South Australian framework for sustainable schools broadened the view of EfS, promoting an integrated approach in keeping with ESD, by linking ecological with social and economic perspectives at local and global levels, recognising that "the world's ecology and development are fundamentally linked" and that "all decision making considers environmental, social and economic consequences" (DECS, 2007, p. 3). It promoted a whole school approach and acknowledged the transformative role of education as learners engaged in new ways of seeing, thinking and learning towards a sustainable future (DECS, 2007, p. 4). Values were emphasised in the framework as an essential foundation for sustainability initiatives, integrated throughout the school's ethos and curriculum (DECS, 2007, pp. 7-10). The framework encouraged progressive integration of the various dimensions of sustainability, as they were implemented in four phases, from **starting**, to **challenging** and **committing**, and finally to the **transforming** phase.

The key features of a whole school approach to EfS practised by participating AuSSI schools were consistent with quality approaches to ESD as stipulated in the IIS. These features are listed in Appendix 15 alongside a similar description of a whole school approach in the 2005 *National Environmental Education Statement for Australian Schools* (DEH, 2005, pp. 10-12). Despite the rhetoric and the strength of whole school approaches to EfS taken by participating AuSSI schools, environmental concerns continued to dominate learning activities. The features of whole school approaches to ESD are discussed further in Chapter 7.

Values education and Education for Sustainability (EfS) were not the only areas of Australian schooling in which ESD was reflected. For example, the Studies of Society and Environment (SOSE) learning area was underpinned by values relating to social justice, democratic process and ecological sustainability, in keeping with ESD, only the economic dimension was missing, but Global Education initiatives provided the closest fit with ESD.

Global Education in Australian Schooling

Global Education emerged in the 1990s from Development Education, which initially began in the 1960s to raise awareness about world poverty and inequitable development in developing countries, often linked to global citizenship education, overseas aid and the consequences of colonialism (Hicks, 2000, p. 7). From the mid to late 1980s, the view of development widened to include social and environmental dimensions, so the scope of Development Education also expanded, in line with emerging integrated understandings of sustainable development. Additional content was then added, such as: (a) social, political and economic development, (b) equity within and between developed and developing countries, (c) the interconnected nature of world events, and (d) links between development and sustaining natural environments and cultures (Calder and Smith, 1991, pp. 13-14).

The shift to Global Education entailed bringing together values-based areas, such as: (a) development education, (b) human rights education, (c) environmental education, (d) peace education, (e) multicultural education, (f) futures studies, (g) the changing role of women in society, (h) the impact of the global economy and changing patterns of work, (i) the revolution of information and communication technology, (j) violence studies, and (k) civics and citizenship (Reynolds, 2001, p. 47) and (Bliss, 2007, p. 1), all of which were relevant to ESD, to promote global awareness and the development of a peaceful, just and sustainable world.

By 2002, an integrated, cross-curriculum, values-based, and whole school community approach to Global Education was documented in *A Statement on Global Education for Australian Schools* (Commonwealth of Australia, 2002). This was revised in 2008 in *A Framework for Global Education in Australian Schools*, which aimed to enable "young people to participate in shaping a better shared future for the world" emphasising: (a) interdependence, (b) appreciation of cultural diversity, (c) social justice, peace and human rights, and (d) action for a sustainable future (Curriculum Corporation, 2008, p. 2). This represented the closest match to the content of ESD of any Australian education document at the time of writing.

The Global Education framework shared many features with ESD, with AuSSI sustainable schools, and with the principles for good practice in values education that emerged from implementing the National Framework for Values Education (NFVE), all of which are summarised alongside each other in Appendix 12.

Conclusion

The schools participating in the Values Education Good Practice Schools Project (VEGPSP), the Australian Sustainable Schools Initiative (AuSSI), and Global Education projects, all

demonstrated values-based, whole school approaches to their subject matter. Their learning activities were also linked to civics and citizenship, and to multicultural and Indigenous education, but only Global Education had systematically interconnected all sustainability dimensions, while presenting a global citizenship perspective.

Most of the examples of environmental sustainability could be found in AuSSI schools, but generally with limited reference to other dimensions of sustainability. Values-based socio-cultural perspectives of ESD were expressed mostly in Studies of Society and Environment (SOSE) relating to: (a) multicultural education, (b) studies of Asia, (c) countering-racism, (d) living in harmony, (e) Indigenous education and reconciliation, (f) human rights education, and (g) civics, citizenship and democracy, but with limited global perspectives.

Over the past decade values have become increasingly explicit in Australian education documents and teachers have developed greater awareness of the values reflected in their practice, largely because of the introduction of the National Framework for Values Education (NFVE). The good practice principles developed during the course of the VEGPSP Stages 1 and 2, and the quality characteristics of EfS and global education in Australian schools, summarised in Appendixes 11 and 12, are added to the summary of evaluative criteria for ESD discussed in Chapter 8, against which the Australian National Curriculum is tested.

Considerable expertise is therefore being developed in quality, values-based, whole school approaches to EfS in Australia but only in participating schools. Thus the existing strong foundation can benefit from consolidation and expansion to all schools, by integrating values and ESD dimensions across curricula for trans-disciplinary learning, and by developing systems thinking and futures problem solving among learners.

Having discussed the ways in which values are currently fostered in Australian schooling relevant to ESD, the next chapter investigates the global values that are applicable to ESD, and compares these with Australian societal and educational values. The strengthening of global values relevant to ESD alongside local values in Australian curricula can assist in better meeting the recommendations for ESD.

CHAPTER 6:   GLOBAL VALUES FOR A SUSTAINABLE WORLD

Introduction

Since the International Implementation Scheme for ESD (IIS) was neither systematic nor comprehensive in identifying the values needed for ESD, it makes sense to identify the values that appear consistently in key international documents relevant to ESD (e.g. peace, human rights, literacy, education for all) covering the multiple dimensions of sustainability. This chapter identifies the global values for ESD most commonly expressed in these documents, how they were derived, where they originated, their meanings, and how they compare to Australian societal and educational values, some of which are discussed in Chapter 5.

Global values

For over 60 years, the United Nations (UN) has encouraged global dialogue on common goals and shared values, beginning with the establishment of the *UN Charter* in 1945 and the *Universal Declaration of Human Rights* (UDHR) in 1948. Since then, numerous conferences have been held and international agreements reached on issues such as peace, human rights, equality, tolerance, diversity, sustainable development and climate change among many others.

Global values were expressed in these agreements, not only in the UN system, but also among other international organisations. The intention was for these values to form the basis for living together peacefully, equitably and sustainably. The opening statements of many international documents referred to the principles expressed in the 1945 *UN Charter* and the 1948 *Universal Declaration for Human Rights* (UDHR), as key source documents from which many of the global values have been drawn. For example, Unesco's constitution, founded in 1945, called for "the intellectual and moral solidarity of mankind", based on the values of dignity, equality,

mutual respect and understanding, peace, truth, and democratic principles of justice, liberty and equal opportunity (Unesco, 1999b, p. 212).

However, the world has changed considerably since the *UN Charter* and the UDHR were first framed. The rapid rate of environmental degradation could not have been foreseen, nor the values that would be needed to conserve and respect the natural world. The Report of the World Commission on Culture and Development (WCCD) highlighted the need to review the UDHR to incorporate emerging issues, including intergenerational equity and the rights of future generations (de Cuéllar, 1995, p. 17). More recent international dialogue around sustainable development has culminated in key documents, such as the UN Millennium Development Goals (MDGs) in 2000, the International Implementation Scheme for ESD (IIS) in 2005, and the World Programme on Human Rights Education (WPHRE) in 2006, which also contained global values. This study argues that these global values are needed to create a peaceful, just and sustainable world, and therefore have a place in education, without subsuming local, cultural values.

The global values, expressed in 22 relevant international documents, spanning a period of 60 years from 1945 to 2005, are collated and listed in Appendix 16. The 22 documents, from which the global values are extracted, are listed in Appendix 17. The global values that appear most frequently in the documents are grouped according to similar concepts and listed in Appendix 18 in order of their frequency, and in Table 6.1. For example, the global value of 'dignity' encompasses many concepts and meanings such as: well-being, welfare, quality of life, standard of living, social progress, advancement, poverty alleviation, livelihood, decent living, sufficiency, work rights, and prosperity. Similarly, the values of 'equity' and 'equality' cover the terms 'equal opportunity', 'equal rights', 'equal access', 'fairness' and 'non-discrimination', while 'integrity' includes 'honesty', 'truth' and 'accountability'.

Since almost all 22 documents refer to the *Universal Declaration of Human Rights* (UDHR) as a key source document, 'human rights' itself is not listed as a global value. The all-encompassing term 'sustainability' is also not listed as a value, since this study argues that all global values contribute to the development of sustainability. The value of 'interdependence' is implied in many documents but is not explicitly stated as a value, since it is a factual reality in a globalised world rather than an aspirational ideal. The term 'participation', although not strictly a value, implies full and equal democratic participation of citizens in all aspects of society. The global values most commonly found across the 22 international documents are listed in Table 6.1, and are categorised in order of frequency according to the ESD dimensions of sustainability in the IIS.

Table 6.1 - Global value sets found in international documents

Social	Cultural	Environmental	Economic
equality, equity	equality, equity	inter-generational equity	equality, equity
responsibility	responsibility	responsibility	responsibility
democratic participation	democratic participation	democratic participation	democratic participation
cooperation	cooperation	cooperation	cooperation
dignity	dignity	-	dignity
freedom, liberty	freedom, liberty	-	freedom, liberty
security, safety	security, safety	security, safety	security, safety
peace, harmony	peace, harmony	harmony	-
protect, preserve	protect, preserve	protect, preserve	protect, preserve
respect	respect	respect	respect
dialogue	dialogue	dialogue	dialogue
integrity, honesty	integrity, honesty	integrity, honesty	integrity, honesty
diversity	diversity	ecological diversity	-
tolerance	tolerance	-	-
justice	justice	inter-generational justice	justice
solidarity	solidarity	solidarity	solidarity

See Appendixes 16, 17, 18 and 20 for the collation, sources, grouping and descriptions of these global values.

Of the values that appear less frequently in the documents, some are personal in nature (i.e. care, love, nurturing, gratitude, appreciation, reverence for life and for the environment, generosity, love, humility and sharing), representing values-based qualities necessary for a sustainable world, while others have a socio-political dimension (i.e. empowerment, independence, autonomy, sovereignty, self-determination, privacy, confidentiality, informed or free consent) associated with the listed global value of 'democratic participation'. Yet others relate to 'creativity' (i.e. innovation, creativity, imagination), needed for inventing new technologies for sustainable lifestyles and work practices, which flourish in societies that observe the global values of freedom, safety, dignity, diversity, harmony and tolerance.

Haidt's Moral Classification System

The global value sets in Table 6.1 are categorised according to the four dimensions of sustainable development to demonstrate their relevance to ESD. However, another way of classifying the values to demonstrate their applicability across cultures, is to adapt and broaden Haidt's comprehensive moral classification system, discussed in Chapter 4, including the proposed additional classification called 'living in harmony with nature', which acknowledges the Indigenous world view.

It is argued that the scope of Haidt's classifications needs to be updated and broadened to accommodate global values as follows: (a) 'in-group loyalty' to include both 'solidarity' among minority groups, and as global citizens for all humanity in recognition of shared challenges; (b) 'respect for authority' to include 'respect' for the ethical authority of the UN system of principles and values peace, justice, human rights and sustainability; and (c) 'sanctity and protection' to include recognition of the sanctity of all life and the need to protect living systems, upon which human beings depend for survival, from being polluted or destroyed.

The application of the global values in Table 6.1 to the broadened framework of moral systems proposed, appears in Appendix 19, in which the distribution of global values across the adaptation of Haidt's moral systems reveals considerable overlap, attesting to the interdependency of values. Haidt defined moral systems as 'interlocking' sets of values and practices that worked together to regulate selfishness and make cooperative social life possible (Haidt, 2008, pp. 65-72), applicable at both local and global levels.

Global values cannot exist in isolation, since they are interconnected, forming a coherent framework that represents an overall world view conducive to sustainable development. The nature of such a global paradigm is discussed by many theorists and variously named 'worldcentric' (Wilber, 2000), 'planetist' (Ellyard, 2001), 'interdepending' (Hall, 1994), or simply 'global', requiring the development of certain cognitive and socio-emotional capacities, and 'whole systems thinking' (Sterling, 2003), linked to global citizenship.

Meaning of global values

Mere lists of global values, as displayed in Table 6.1, however they may be classified, do not give a true indication of the depth of meaning of each value, especially when taken out of context. Lists of values cannot indicate the various ways in which each value is interpreted when applied in diverse cultural and social contexts. Each value contains multiple levels of meaning, interconnecting values, different interpretations at various times in history, or when applied to local contexts. The descriptive explanations for each global value are listed in Appendix 20 in relation to contemporary interpretations, applied to sustainable development at national and global levels.

Global values are needed to foster and maintain a peaceful, just, humane and sustainable world, starting from the personal and local level, expanding to global applications. They apply at personal, family, workplace or school, community, organisational, national, regional and global levels, and can be applied interpersonally on a one-to-one, group-to-group, or nation-to-nation level, as well as on an individual to group basis. The development of values therefore begins for young children within the family and classroom, and over time expands in application to ever-widening organisational, societal and global levels as the child matures. This implies that the development of values involves a lifelong learning process.

Analysis of global values

As may be seen in Table 6.1, most of the global values are relevant to all ESD dimensions and also overlap across the dimensions, indicating the interdependent nature of the values. For example, without justice, equity, respect, dignity, freedom, cooperation, tolerance and dialogue, it is difficult to maintain peace, dignity and well-being. Without peace it is difficult to preserve cultural and natural diversity and the environment, and to ensure human dignity. Without solidarity and cooperation it is likely to be difficult to achieve justice and democracy. Without democratic processes, freedom, justice, equality and participation may be minimal. The *Universal Declaration of Human Rights* (UDHR) included social, cultural, civil, political and economic rights, because they could only be implemented successfully in combination with each other and were therefore considered "indivisible" (UN, 1948). The interconnectedness of global values, applied to the interlinked dimensions of ESD, therefore have implications for an integrated and trans-disciplinary approach to ESD requiring holistic systems thinking and complex problem solving.

The global values identified in Table 6.1 fit within the various categorisations of values described in Chapter 4, since some are 'foundation' values relating to basic needs, and others are visionary, future-oriented and aspirational, promising a peaceful, just and sustainable world, and yet others are 'focus' values forming the basis of decisions and actions, in keeping with Hall's classification (Hall, 1994, p. 84). Although they are idealistic in aiming for universal human well-being, they are increasingly essential for adaptation and survival in a world challenged by climate change, and are both personally relevant, and objectively agreed upon as being socially beneficial.

Many of the global values may also be considered what Rokeach (Hall, 1994, p. 29) described as 'terminal' or 'ends' values (e.g. peace, freedom, dignity), while some are instrumental or 'means' values (e.g. cooperation), and yet others are both 'ends' and 'means' values (e.g. justice). Global values have both 'intrinsic' and 'extrinsic' worth, since they lead to benefits for the individual and for society, and are therefore functional or instrumental in contributing to collective well-being. This perspective is consistent with Locke's view of values as being advantageous to society, and with Confucian thought regarding the need to develop morals in the individual for the benefit of society. Global values are at the same time humanistic, in that they affirm the dignity and worth of all people equally, consistent with the Kantian view of treating human beings as 'ends' and not 'means'.

A values hierarchy

The question arises as to whether there is a hierarchy of values, not necessarily reflected in a frequency tabulation, in which some values are more important than others. Such a hierarchy may depend on the context, in accordance with Bateson's assertion that all meaning is contextual (Bateson, 1979), or on human needs, in line with Maslow's hierarchy of needs (Maslow, 1943).

For example, in a country ravaged by war, values associated with safety, security, sustenance and shelter are likely to have high priority, along with trust, loyalty and courage. Truth, which at other times might be highly prized, may be sacrificed to save lives. On the other hand, in peaceful and abundant societies, values associated with identity, belonging, esteem, aesthetics and self-actualisation may gain greater significance, depending on underlying cultural and religious world views. In subsistent Indigenous societies however, this hierarchy of values can come under challenge, since identity, belonging and spirituality through identification with the land are paramount. A starving population may be more interested in a secure food supply than democratic participation, freedom or dialogue, although Sen cited examples from South Korea, Thailand, Bangladesh, Pakistan, Burma, and Indonesia, where hunger did not prevent people from fighting for democratic freedoms (Sen, 1999b, p. 13).

Values differ between cultures and between developed and developing nations at different stages of development, suggesting that some priorities among the values may change over time as progress occurs and as human needs change, while others may reflect timeless, universal principles such as those expressed in the UDHR:

> Human rights … express absolute, timeless injunctions, yet simultaneously reflect a moment in the development of history. Human rights are both absolute and historically defined. (Boutros-Ghali, 1993)

This is demonstrated by the findings of the World Values Survey (WVS), conducted every five years since 1981 by social scientists at universities around the world. The WVS provided a comprehensive measurement of all major areas of human priority across cultural groupings, demonstrating diverse values at various points of human development. The results were correlated by Inglehart and Welzel (2006) on a World Values Map, shown in Figure 6.1. This reveals that a large number of values are closely interrelated and can be depicted in two major dimensions of cross-cultural variation, the first being between traditional and secular-rational

values, and the second, between values related to survival and self-expression. These two dimensions explain over 70 per cent of the cross-national variance and are strongly related to many other important values orientations.

NOTE:
This figure is included on page 130 of the print copy of the thesis held in the University of Adelaide Library.

Figure 6.1 - Inglehart-Welzel Cultural Map of the World (Inglehart, and Welzel, 2006) showing countries that express four diverse values types.

The vertical dimension of the cultural map in Figure 6.1, shows a general human development trend over time, particularly among developed, post-industrial societies, towards increasing secular and rational values, accompanied by stronger individualism and self-expression values. This is the case, for example, in English speaking countries, Protestant Europe and to a lesser

extent in Japan, Latin America and Catholic Europe. This trend contrasts with traditional

societies, for which religion, traditional family values, parent-child ties and absolute moral

standards are important. These societies also hold a collectivist and nationalistic outlook, with

high levels of deference to authority and national or cultural pride, implying greater levels of

social control. Societies with secular-rational values on the other hand, hold opposing

preferences in these areas.

The horizontal dimension in Figure 6.1 shows a polarisation on the one hand, between

materialist survival values in developing or industrial societies, and post-materialist, self-

expression values in wealthier, post-industrial knowledge societies on the other, where survival

is taken for granted. The former societies, such as in Africa, South Asia and ex-communist

countries, focused on economic and physical survival and security, while the latter, in

predominantly Western societies, emphasised personal well-being, self-expression and quality of

life. This correlates with Maslow's hierarchy of needs, representing a developmental values

spectrum leading from constraint at one end, focused on basic physical and safety needs for

survival, to choice at the other, in which social and psychological needs and self-expression are

valued. This supports the view that values are developmental, shaped by context and

circumstance.

Inglehart (2006) found that these cross-cultural variations and shifts, from traditional and

survival values towards secular and self expression values, were linked to modernisation and the

transition from industrialised to knowledge societies. The societies that tended towards secular-

rational values and greater self-expression placed a higher priority on tolerance of diversity,

environmental protection, economic and political participation, and decision making, and

individual rights and freedom. The shifts in values were also reflected in changed attitudes

towards child-rearing, fostering creativity, imagination, tolerance of difference, and a culture of interpersonal trust and well-being, in which people felt safe to engage in social or political activism. Inglehart found that "these are precisely the attributes that the political culture literature defines as crucial to democracy" (Inglehart, 2006). These also reflect the values needed for sustainable development, suggesting that the promotion of such values can complement and even hasten development, provided the desired values of traditional societies also endure.

The findings of the World Values Survey (WVS) supported Dewey's view that individualism emerged in modern times as a result of "the relaxation of the grip of the authority of custom and traditions as standards of belief", and that conservative or traditional societies either repressed or did not promote "individual diversities". Dewey also linked the modern view of individualism with freedom of thought in a progressive, democratic society which "counts individual variations as precious since it finds in them the means of its own growth" (Dewey, 1916, p. 305). Dewey's perspective on individual freedom and diverse capacities as being vital to growth, accorded with Sen's view that freedom was both the end and means of development (Sen, 1999a, p. xii), confirming that efforts towards sustainable development were accompanied by global values that reflected freedom and democratic participation.

With respect to a discussion regarding the relative importance of some values over others, a hierarchy of values not only depends upon human needs and the stage of development, but also upon underlying cultural and religious values. For example, of the global values listed in Table 6.1, harmony, responsibility (or duty), cooperation and respect can be more highly rated in collectivist and Indigenous cultures such as in Asia and the Pacific, than in individualistic Western cultures (Curriculum Corporation, 1998, p. 5). The East considers individual rights and freedoms to be secondary to national security, stability and social cohesion, and equality to be

achieved through uniformity, while taking account of continuity, tradition and long-term planning into the future. The West, on the other hand, views rights and freedoms as paramount and inalienable, among these being equality and individuality, and seeking quick, short-term solutions, while placing less importance on tradition and continuity. Some Western countries, in particular the United States, appear to give greater priority to civil and political rights over social, and economic ones (i.e. heath, housing, work), while some Asian cultures place greater importance on social and cultural rights. Having said this, Asian cultures differ greatly from one another in culture, religion and values, as do Western cultures, necessitating caution in making such generalisations.

The report of the World Commission on Culture and Development (WCCD) considered that cultures were not separately delineated, coherent wholes, easily distinguishable from others by unified systems of ideas and beliefs (de Cuéllar, 1995). Thus, they may overlap, share many values, have common origins and experiences, interact and exchange ideas, and often learn from each other. Moreover, there is not uniformity of values within cultures, and there are often sets of values and ideas shared by people across cultural boundaries.

In considering the relative importance of some values over others, Vasak classified rights into three main tiers of importance. The first was 'civil and political', the second, 'economic, social and cultural', and the third, 'solidarity rights', related to peace and a clean environment, which were not based in international law, unlike the first two (Vasak, 1977). Such a hierarchy could open the door to national security or emergency being placed ahead of human rights, which the UN stated should only occur as a "last resort and a temporary measure" and must represent a threat to the "very existence of the nation" (UN, 2003).

Moreover, Vasak's framework contradicted Inglehart's World Values Survey (WVS) findings that economic and social well-being generally preceded and facilitated democratic values and processes, but the WVS supported Vasak's view of solidarity rights to peace and a clean environment as a third tier priority. The challenge of climate change to human survival might alter current views of levels of rights, needs and values, giving precedence to the rights of future generations to sufficient resources and a habitable environment in which to subsist.

Maslow's hierarchy of needs is mapped against global values in Appendix 21 as an alternative framework for identifying whether priorities exist among global values. A comparison reveals that most global values relate to fundamental human physical, social and psychological needs, but the structure of Maslow's framework assumed that higher level needs pre-supposed the existence of lower level needs having been met. Therefore, the positioning of the global values (i.e. respect, dignity, justice, equality and non-discrimination, freedom and liberty) at Level 4 in Appendix 21, suggests a reciprocal, interdependent relationship between Level 4 values and those at Levels 1 to 3, in keeping with Maslow's assertion.

Max-Neef contradicted Maslow's framework, stating that:

> human needs must be understood as a system: that is, all human needs are interrelated and interactive. With the sole exception of the need of subsistence, that is, to remain alive, no hierarchies exist within the system. (Max-Neef, 1991, p. 17)

Max-Neef's position accorded with the UN, which had repeatedly affirmed the indivisibility of human rights and needs:

> All human rights are universal, indivisible, interdependent and related. The international community must treat human rights globally in a fair and equal manner, on the same footing, and with the same emphasis. (UN, 1993; UN, 2005b)

Hence this study assumes that all global values are closely interconnected and of equal importance, except in extreme circumstances as defined by the UN, but that some cultures emphasise certain values over others, depending on circumstance.

Origins of global values

The origins of values are examined here in order to understand how the values in Table 6.1 came to be considered global. The use of the term 'values' is relatively recent, having been popularised under Nietzsche's influence in philosophy and applied to the fields of sociology and psychology, and later to education (Boudon, 2001, p. 1). Hall argued that while "human virtues came from philosophers and religious thinkers, the concept of human values came from social psychologists and educators" (Hall, 1994, p. 25). For the purpose of a broader analysis of the origins of values, no distinction is made here between values, morals, virtues or ethics.

It is thought that values evolved primarily from Western thinking, originating in Greek philosophy, from the moral virtues and Aristotelian ethics, which filtered through the Middle East to European Medieval Christian thinking and later European philosophers, finally to impact on Western thought in modern times. However, Armstrong's comprehensive analysis (2006) of the virtues and morals that emerged across Axial peoples dating back some 3000 years, revealed strong similarities among the ancient moral traditions of Eastern, Indian, Middle Eastern and Western societies as they emerged progressively during the Axial Age. Armstrong claimed that the foundations for modern morals and values were established during the Axial Age between 900 and 200 BCE; one of the "most seminal periods of intellectual, psychological, philosophical, and religious change in recorded history … until the Great Western Transformation" (Armstrong, 2006, p. xii). In four regions of the world during that time, the great world traditions emerged, namely: Confucianism and Daoism in China, Hinduism and Buddhism in India,

monotheism in Israel, and philosophical rationalism in Greece, through which "an entirely different kind of human experience" began based on reason (Armstrong, 2006, p. xii).

The values and ideals expressed across cultures during this period are collated in Appendix 22, revealing that the values of kindness or compassion for others, peace or non-violence, respect, trust or honesty, responsibility and justice or fairness, were commonly expressed by almost all Axial cultures, and are reflected in the global values of today. Although the Axial societies did not necessarily live up to their ideals, they all at various times, shared values of respect and universal concern, expressed through sympathy, empathy, compassion or care, encapsulated in the "empathic spirituality of the Golden Rule" (Armstrong, 2006, pp. 390-1).

The various expressions of the 'Golden Rule' of "do as you would be done by" (UN, 2006), listed in Appendix 23, are latent within global values such as respect, justice, fairness, equality, and dignity, since the rights and well-being of others are also those that are desired for ourselves. The Axial thinkers extended empathy, compassion and benevolence to the whole world, not just to family and compatriots, since it was thought that kindness, charity and generosity "could save the world" (Armstrong, 2006, pp. xii-xiv). Armstrong argued that the insights of the Axial Age had never been surpassed, and that humanity had turned back constantly to this period for inspiration in times of crisis. In order to address the threats faced by humanity today, Armstrong called for the development of a "global consciousness" since "we live in one world", and a return to "the spirit of compassion that lies at the core of all our traditions" (Armstrong, 2006, p. 397-399), adapted to "the best insights of modernity" (Armstrong, 2006, p. xvii). These "best insights" were expressed in the various UN documents that promoted the highest human shared ideals or global values of humanity.

Nature or Nurture

The UN Group of Eminent Persons (UN, 2005a) shared the view that similar values and virtues had prevailed across civilisations, cultures and faiths from recorded times, indicating that certain universal values were integral to what it meant to be human.

Although Armstrong did not examine the values of Indigenous societies, similarities did exist despite limited or no contact between them, particularly relating to interconnectedness and harmony with nature. Since similarities among Indigenous and Axial societies cannot merely be attributed to mutual influence and exchange, it generates speculation as to whether some values are part of human nature, independent of culture and socialisation. Of these similarities Armstrong claimed:

> The fact that they all came up with such profoundly similar solutions by so many different routes suggests that they had indeed discovered something important about the way human beings worked. (Armstrong, 2006, p. 391)

Some researchers considered that certain universal values were inherent to the human condition, forming part of our biological or genetic make-up, whether positive or negative (Dawkins 1976, Pugh 1977, Pinker 2003, Sperry 1983). In fourth century BCE China, the Confucian Mencius believed that it was natural for people to behave morally, and to respond compassionately to suffering (Armstrong, 2006, p. 203). Darwin observed in his own son of six months an emotional response of empathy when someone cried (Darwin, 1872), causing him to reflect on the innate nature of 'compassion', a key value of all Axial cultures. Sperry considered that certain values inherent to all human beings formed the basis for subsequent acquired or socialised values (Sperry, 1983).

Hall, on the other hand, claimed that values were absorbed from the family forming a core foundation of values in the early years of life that was overlaid by subsequent social, cultural and

religious influences (Hall, 1994). However, Pinker saw human nature as potential that sprang

from "the combinatorial interplay of wonderfully complex faculties, not from the passive

blankness of an empty tablet" (Pinker, 2003, p. 421). Marcus (2004) considered morality to be

innate but malleable, based on experience. Ridley found that genetic coding was not necessarily

fixed for life, but indicated an innate tendency that interacted with, and was influenced by, the

environment. He claimed to have brought to an end the century-long nature-nurture debate by

finding that both were true (Ridley, 2004). This was supported by recent findings of neural

plasticity, which showed that thinking, learning and certain physical activities could change the

brain's anatomical structure and physiological organisation, even in adulthood (Doidge, 2007).

These findings provide further evidence that values education can indeed have a positive effect

on learners. It is possible then that both nature and nurture are involved in values formation and

that at least some values are both inherently universal, and shaped by socio-cultural

environments.

Reason and emotion

Since various thinkers had attributed moral judgements to either emotion (Hume), or reason

(Rawls), or both (Kant), it might be concluded that both reason and emotion were, or should be,

involved in the determination and application of values (Haidt, 2004). Many philosophers,

including Hume and Wilson, had argued that reason alone could not determine moral choices.

> Reason is, and ought only to be the slave of the passions, and can never pretend to any
> other office than to serve and obey them. (Hume, 1739)

Glover noted that many atrocities had occurred using reason alone and that moral sentiments and

feelings of empathy had often prevented people from engaging in such atrocities (Pinker, 2003,

pp. 279-280). Conversely, Pinker cautioned against the sole use of emotional response as moral

justification without logical reason, since this might merely represent discrimination or

preference (Pinker, 2003, pp. 274-280). The tension between the use of reason and the influence of emotion on human activity began in the Western world during the classical period in the Axial Age (Armstrong, 2006, pp. 220-227). Armstrong claimed, "reason was becoming a frightening tool (that) could … find cogent reasons for cruel and perverse actions" (Armstrong, 2006, p. 254). Where solely reason or emotion was involved, the outcome in each case, was likely to be destructive (Damasio, 1994), since both were needed. This applies equally today, when reason alone shapes decisions, without the balancing influence of values motivated by feelings of compassion. The implications for values education involve the application of both moral reasoning and affective values development.

Emotionally-laden values, combined with a reasoned decision making process, play a motivational role for considered ethical action. Learning processes that are appropriate for ESD, balance cognitive, functional and affective development, combining values with moral reasoning, and critical and systems thinking, for ethical decision making and problem solving leading to ethical action.

Objections to global values

Global values had their origins primarily in the Western liberal tradition (i.e. liberty, equality, justice and the rule of law), and could be traced to the formation of the United Nations (UN) and the development of international law. Many global values also had humanist origins (e.g. dignity, well-being, truth), based on reason and concerns about human well-being. While the roots of contemporary humanism could be traced to Western thinking in Greek philosophy, the European Renaissance and the Enlightenment, similar values also emerged from: Chinese Confucianism (e.g. duty, truth, honesty, responsibility, empathy, understanding, doing good for others); Buddhism (e.g. compassion, ethical responsibility, altruism, liberation of all beings from

suffering); and among some writers of the Islamic Renaissance (Goodman, 2003, p. 155). There were also forms of religious humanism among the Jewish and Christian faiths.

Liberal and humanist thought was captured in the *Universal Declaration of Human Rights* (UDHR), which was originally accepted voluntarily by all UN member countries, and from which global values in subsequent documents were heavily drawn. However, objections to claims of universality of the UDHR have emerged in recent decades, particularly by Asian and Muslim nations, on the basis that these did not represent or take account of historical, cultural or religious contexts, reflected for example, in Asian collectivist values and Shari'ah law.

In answering such objections, former UN Secretary-General Boutros-Ghali, recalled that international standard-setting instruments were the "common property" of the "international community as a whole" containing "the quintessential values through which we affirm together that we are a single human community!" (Boutros-Ghali, 1993, p. 3), and which ought to be "enough to satisfy all States, all peoples and all cultures". (Boutros-Ghali, 1993, p. 7)

Although the origins of global values might have been predominantly Western, this did not invalidate them as a contractual basis for living together peacefully, justly and sustainably, for which they were endorsed by UN member countries. Sen did not consider that universal agreement was needed for a value to have universal application:

> universal consent is not required for something to be a universal value. Rather, the claim of a universal value is that people anywhere may have reason to see it as valuable. (Sen, 1999b, p. 9)

The Report of the World Commission on Culture and Development (WCCD) considered that global values were based on certain fundamental ideas that carried moral authority of themselves (de Cuéllar, 1995). Global values are ideals that either resonate with everyone or are desirable

for the well-being of all, in both the short and long term, at both individual and collective levels, and which have the capacity to unite humanity in common endeavour, so the issue of whether they are equally important to all cultures or faiths is less important than the well-being of all. A global consensus based on values involves **transcending** individual values for the greater collective good at the global level, while continuing to observe culture-specific values at the local level, provided these do not negate the freedoms, safety, rights and well-being of others, including of future generations.

> human rights … can be brought about only if we transcend ourselves … find our common essence beyond our apparent divisions, … differences, (and) ideological and cultural barriers. (Boutros-Ghali 1993, p. 3)

Boutros-Ghali recalled that the human rights on which global values were based, "viewed at the universal level … teach us … that we are at the same time identical and different" (Boutros-Ghali, 1993, p. 2). However, differences between cultures are rapidly diminishing in global and intercultural contexts. While the West expressed individualistic values, and the East collectivist ones, Ellyard contended that there is evidence of a shift towards the centre because of globalisation, telecommunications and international exchange (Ellyard 2001, pp. 35-38), trending towards voluntary interdependence, with elements of both individualism and collectivism according to need and the common good (Ellyard, 2001, pp. 167-168). However, Armstrong (2006) considered that the difference between East and West had also been between the Eastern development of the inner self, and the Western focus on the rational self, for which values can assist in establishing balance.

This study argues for the inclusion of global values in education at the national level, alongside local or national values, to foster the development of responsible national and global citizens able to contribute to the well-being of the collective. In a multicultural and multi-faith society such as Australia, a legal and constitutional framework contains the values of a social contract by

which Australian residents agree to abide, while enabling the freedom to express diverse personal or cultural values, provided that Australian laws are not broken or the rights of others not violated. The same can apply to the application of global values within the international community.

Comparison between global and Australian values

The values predominant in Australian society today, are a reflection of the social and cultural composition of a richly diverse multicultural society, including those with Indigenous beginnings. Some of these values date back to Australia's legal, civic and political heritage from British origins, others stem from Australia's predominantly Christian heritage since colonisation, and yet others continue to form, as successive waves of migrant cultures progressively make their mark. Many Australians of migrant origin have a collectivist tradition, as do Indigenous Australians, which is progressively influencing the predominant Western culture, leading to a combination of individualism and collectivism.

It is increasingly difficult to make generalised statements about value priorities in Australia beyond a certain point, since 27 per cent of Australia's resident population were born overseas, 22 per cent spoke a language other than English at home, and over 44 per cent were either born overseas or had at least one overseas-born parent (ABS, 2006). Nonetheless, certain general observations are made here for the purpose of comparison to global values.

Values are contained in Australia's political and judicial instruments, such as the Australian Constitution, which protects some human rights and freedoms, such as freedom of religion, and freedom from discrimination on grounds of state residence (Commonwealth of Australia, 1995). Other rights are protected by parliamentary legislation and by common law, relating to, for

example: equality of opportunity, privacy, non-discrimination, freedom of religion, and religious and political association, consumer protection, the right to justice, health and education, the principle of merit, and a safe work environment, rights of the disadvantaged, children, prisoners, the disabled and landowners, indicating the importance of fairness and equity in Australian society. Accompanying these rights are the responsibilities of citizens to fulfil their civic duty to obey the law, give evidence, serve on juries, pay taxes and vote at elections, for example, contained in the principle of 'mutual obligation', upon which socio-economic policies are based.

In recent years these values have been eroded by increasing materialism, individualism and selfishness (Flowers, 2002). Nonetheless, values of cooperation and notions of 'mateship' are still evident in some aspects of Australian society, such as sport, the trade union movement, in rural communities, and in times of natural disaster. In some areas, community rights are gaining ground over individual rights, evidenced, for example, by the prohibition of smoking in public places and by gun control (Ellyard, 2001).

Christian values of equity and a 'fair share' for all, underlie the Australian social welfare system, expressed though care and concern for the well-being of children, the disadvantaged, the disabled, and the poor. While Australians are becoming less religious, there is evidence of increasing spirituality expressed in a secular way through, for example, a commitment to the natural environment, social justice issues, human rights and peace activism.

Based on a national survey conducted in 2000, the Australian Citizenship Council issued seven core civic values and commitments (Australian Citizenship Council, 2000), which were replaced in 2007, by a Statement of Australian Values that all adult visa applicants were to sign as confirmation of their intention to respect the Australian way of life and to obey Australian laws

(DIC, 2007). The values in these two documents are synthesised with the Australian values

discussed above, and listed in Column B in Appendix 24. Column C contains the values

expressed in the National Framework for Values Education (NFVE) in Australian Schools, since

it is expected that Australian societal values are reflected in the education system (DEST, 2005).

Column A in Appendix 24 contains the global values discussed earlier, to enable a comparison to

be made between Australian and global values. A relationship between Australian and global

values is found, except for the values of solidarity, open dialogue, peace, and dignity, which are

not part of everyday Australian parlance, except in specific quarters such as the Trade Union

Movement, and the health and welfare sectors. However, the spirit of these global values are

evident in Australian terms such as 'mateship', 'social cohesion', 'fair go' and 'equity'.

Although the value of 'safety' does not appear in the NFVE in Column C in Appendix 24, it is

given a high priority in Australian schools through the National Safe Schools Framework

(MCEETYA, 2003). The value of 'cooperation', which also does not appear in Column C, is

emphasised in the classroom, in sport and in the workplace as 'team work' and 'team spirit'.

Two of the global values that are not evident in either Columns B or C, are 'solidarity' and 'open

dialogue', but are reflected in the Australian terms 'mateship' and 'free speech'. The term

'solidarity' is used in the Trade Union Movement, where the concept of 'open dialogue' is

sometimes replaced with other terms such as 'talks', 'consultations', 'negotiation' and

'bargaining'. The term 'acceptance' is often used in Australia in place of 'tolerance', since the

notion of tolerating or 'putting up with' diversity is rejected in favour of embracing, celebrating

and accepting it. Although the values of 'truth' and 'honesty' are in the NFVE, they are not

reflected in the 2007 Statement of Australian Values but are inferred, for example, in the

separation of powers stipulated in the Australian Constitution, and in ethics across various

professions.

Australian society, like others, is not uniform in its values, which is not surprising given its cultural diversity. Halstead (1996, p. 7) presented three dimensions for a minimum framework of shared values in plural societies, namely: (a) those relating to basic social morality; (b) acceptance of a common system of laws and governance; and (c) commitment to the values that acknowledged, accepted and respected diversity. These align with the principles underpinning Australian multicultural policy of: (a) civic duty, freedom, equality and diversity to flourish; (b) cultural respect for the right of all to express their culture and beliefs, subject to Australian law; (c) social equity, non-discrimination and equality of opportunity for social, political and economic participation; and (d) productive diversity, to enable economic benefit from cultural diversity (Commonwealth of Australia, 1999). These principles reflect the Australian societal and citizenship values identified earlier, some of the values in the NFVE, as well as many of the global values.

With the exception of 'doing your best', the values in the NFVE match the global values, although some of the terms used are different, as presented in Appendix 24. For example, the Australian concept of 'fair go' equates with global values of 'equity' and 'equality', and the NFVE values of 'honesty', 'trustworthiness', and 'integrity' complement global values of 'integrity' and 'accountability'. Overall, there is a strong relationship between Australian and Global values, without any conflicts being evident, therefore making it relatively easy to adopt global values in the Australian education system, alongside local values.

Reconciling diverse values

Values have been found to be both inherently linked to human emotion, and socially acquired through modelling and the use of reason, leading to values similarities and differences between cultures and also among individuals. But not all values are shared equally, "nor are they given

equal emphasis or priority across cultures, because of cultural or religious layering or for

historical or contextual reasons" (de Leo, 2005, p. 339). Since the construction of values and

meaning occurs contextually, the needs of each situation necessarily influence value priorities.

The relative differences in emphases need not cause conflict if the process of agreeing on values

occurs in shared purpose for the common good, with mutual respect, without negating or

diminishing the value priorities of others. Halstead identified three approaches for reaching

consensus on values, applicable to culturally diverse societies: (a) adopting those of the

dominant group; (b) engaging in a process of democratic negotiation; or (c) adopting values that

were rationally justified as being universally appropriate (Halstead, 1996, p. 7). This study

advocates the latter two, for global values to be adapted to local contexts based on a rational

justification for their application, involving a process of democratic negotiation to enable the

addition of, or emphasis on, local values.

Problems can arise when one group imposes its values on another, or when the cultural practices

of a community contravene local laws or human rights. If the former, processes of negotiation

and dialogue are needed to reach mutual understanding. If the latter, laws may warrant

enforcement, and education programs implemented for rights legislation to be understood.

Differences in values inevitably occur in any context, including in the school community, and

instead of seeing difference as a problem or barrier, it can provide rich opportunities for learners

to make sense of difference through processes of comparison and contrast, leading to deeper

understanding of their own values and those of others (Lemin, Potts, Welsford, 1994, p. 22).

Haydon argued that in culturally plural societies, learners should not only be exposed to a

specific set of values in education, but should also become aware of the diversity of values in

society and develop an understanding of the different meanings attached to values by diverse cultures (Halstead, 1996, p.7).

Halstead emphasised the complexity of clarifying shared values in diverse school communities, acknowledging that "schools must pay attention to the diversity of values in the communities they serve … as well as in society at large, and to the legitimate expectations of interested parties" (Halstead, 1996, p. 8), which "vie for influence and domination" (Halstead, 1996, p. 3). However, the culturally diverse nature of Australian school communities means that few schools are culturally homogeneous, requiring educators to reconcile different or conflicting values.

Democratic processes involving dialogue and negotiation, when skillfully applied, can overcome most differences, particularly when there are equal opportunities for debate in a climate of respect, and individuals, families or communities retain the right to express their personal, religious or cultural values. However, schools need to avoid meeting only the demands of either a dominant group or vocal minority, or agreeing to a watered down list of motherhood statements representing the lowest common denominator in a community, and particularly not to give credence to cultural values, which may conflict with legal requirements or human rights.

Conclusion

The global values contained in numerous international agreements are agreed upon as the basis for living together, and are needed for promoting peace, equity, and sustainability for humanity as a whole, notwithstanding diverse local values. Although current practice is far from achieving this ideal, such aspirational values are essential for education to foster, in order to raise consciousness to the level required for human well-being in a time of change.

Australian values complement global values, even if societal emphases may differ, so it is not difficult to integrate global values into Australian education, building upon existing initiatives, especially since Australian schools negotiate value priorities to accommodate local needs.

Having explored in depth both the **nature** of values and values education, and **which** values can best serve the goals of ESD, the next chapter shifts the focus of the study to **how** values might best be integrated in education. It begins by examining the features and characteristics of quality approaches to teaching and learning for a sustainable society, with a particular emphasis on values.

CHAPTER 7: QUALITY TEACHING AND LEARNING FOR SUSTAINABILITY

Introduction

In earlier times the **content** to be taught had always been of primary importance to educators

rather than the **process** of teaching and learning. In the eighteenth century new ideas began to

emerge in the West, expressed by Rousseau, Herbart, Froebel and others about educational

processes and the implications for teaching practice. In time educators also began to emphasise

the quality of the learning environment and the learning experience, relationships for whole child

development, and their impact on values formation.

Downey (1965, p. 88) proposed that education had three dimensions of relatively equal

importance, namely: (a) **substantive**, referring to content and teaching strategies; (b)

behavioural and procedural, referring to the school ethos, student development and teaching

and learning styles; and (c) **environmental**, referring to the physical context, facilities and

resources. Together these could lead to transformative change for the individual and the school

community when underpinned by values.

This chapter examines the quality features of values-based ESD that maximise the likelihood of

achieving the outcomes intended in the IIS, and which contribute to the development of a

comprehensive framework of quality characteristics for ESD, which are then used as evaluative

criteria against which the Australian National Curriculum is tested in later chapters.

Quality Education for Sustainable Development

There has been ongoing debate among educators throughout the world about what constituted

quality education, and much has been written on the subject. Adams (1993) identified 50 co-

existing definitions of quality education indicating that notions of quality were dynamic, incorporating both quantitative and qualitative aspects. Harvey outlined five goals driving quality education: (a) achieving learner excellence, (b) consistency, equality and equity, (c) instrumental for vocational preparation, (d) efficiency in delivering value for money, and (e) potential for positive personal or social transformation (Leu, Price-Rom, 2005, p. 2), of particular relevance to Education for Sustainable Development (ESD).

Although many variables affected the quality of education, measurements of student academic performance, completion rates and vocational outcomes alone, would not lead to the development of a peaceful, just and sustainable society. Other factors that were generally not measured, such as the quality of relationships and the learning environment, the school ethos, and the all-round development of the learner, have been argued to be more influential in developing the "character that a society values in young people" (Leu, 2005, p. 5), for achieving "the vision and values of Sustainable Development" (Unesco IIS, 2004, p. 16).

The IIS identified quality as one of the five ESD objectives, to enable learners 'to be', 'to do', 'to learn' throughout life, to think critically, search out and apply new knowledge, and to make decisions leading to sustainable development (Unesco IIS, 2004, p. 16). Learning was to be based on values that were modelled in the learning process, using high quality materials and diverse methodologies (Unesco IIS, 2004, p. 40). The quality characteristics of ESD described in the IIS are summarised in Appendix 25, alongside other related quality frameworks, such as those in: (a) Goal Six of the Dakar International Framework for Action for implementing Unesco's Education For All (EFA) initiative in 2000 (Unesco Dakar, 2000, p. 17); (b) the Ministerial Communiqué on Quality Education, based on Unesco's 2003 international consultation with Education Ministers (Pigozzi, 2004); (c) the 2005 Education for All (EFA)

Global Monitoring Report (Unesco EFA, 2005); (d) the 2005 Situational Analysis of ESD in the Asia-Pacific Region (Unesco Bangkok, 2005b); and (e) the 2006 Plan of Action for the first phase of the World Programme for Human Rights Education (OHCHR, 2006). A comparison of the features common to these frameworks indicates the international consensus that has developed around what constitutes quality education, based on values, equity, local relevance linked to global concerns, and participative, child centred learning. In all cases, values are considered central to quality education.

The evolving concept of quality education has therefore expanded beyond instrumental goals, to embrace a humanistic focus on developing the whole child and capacity for social action, in which values play a key role. In Australia, the National Framework for Values Education (NFVE) equated values education itself with good practice pedagogy (DEST, 2005, p. 7), stating that values education "is an essential part of effective schooling" (DEST, 2005, p. 2). This was supported by the outcomes of the Values Education Good Practice Schools Project (VEGPSP) Stage 1, which highlighted the link between values education and quality teaching (Commonwealth of Australia, 2006). Lovat considered that values education had the potential to "complement", "complete" and even to "correct" the goals (i.e. instrumental) of quality teaching (Lovat, 2007, p. 4), because of the transformative impact values had on the quality of relationships and the learning environment.

Supportive learning environments, relationships and modelling values

Children imitate the values that are modelled in their environment, and are largely unaware of this process. McGettrick (1995, p. 2) contended that there were many varied influences in the life of the child, starting with family, friends, cultural and religious contexts, the media and screen-based technologies, which children absorbed unconsciously, and which were "lasting and deeply

rooted". Likewise Mustard argued that by the time children reached school age they had an existing set of values, some positive and others not, which impacted on behaviour (Mustard, 2006). The school environment then became "the most significant influence of all in the formation of values" (McGettrick, 1995, p. 4) because of the large amount of time spent there.

The modelling of values

Given the impact of schooling on learners, the question for educators is how best to influence positively the learners' values, while also fostering their ability to internalise values as they mature.

The final report of the Australian values education study found that "values education worked best when modelled" (DEST, 2003, p. 129), and that "the extent to which teachers actually practised shared values had an important influence on students' values development" (DEST, 2003, p. 9). The IIS also emphasised the importance of modelling by stating that "sustainable development is as much modelled as taught" (Unesco IIS, 2004, p. 20).

Lovat found that "modelling, living out and practising the values that are being enunciated in the curriculum" made the most difference to learners in VEGPSP case study schools (Lovat, 2007, p. 11), and that when values were embraced by the whole school, modelling played a significant role in transforming belief and behaviour (Lovat, 2007, p. 8). West argued that modelling values across the whole school was needed since "young people learn more from the behaviour and attitudes around them than they do from formal instruction" (Halstead, 1996, p. 171). The implications for whole school approaches to values-based ESD are that schools model the values of sustainability in practice and in behaviour across all school activities and operations, and in the classroom, to influence the behaviour and actions of learners, leading to sustainability.

The experience of schools participating in the VEGPSP (Commonwealth of Australia. 2008) found that values were 'caught' through modelling and the informal or hidden curriculum, in addition to being 'taught', suggesting that modelling alone may not have been enough. Halstead (1996, p. 4) argued that "where there is no systematic discussion of values and value issues in the classroom, children may be more likely to develop values haphazardly". In addition to implicit modelling, McGettrick (1995) argued that values also needed to be taught explicitly in the formal curriculum so that learners became consciously aware of the values they held and why they held them, to enable ongoing development of values throughout life, rather than leaving this development to chance.

> With developing maturity, young people begin to structure themselves from within, learning how to develop their own value system, how to be autonomous in the structuring of their values. (McGettrick, 1995, p. 2)

The challenge for values educators is to strike a balance between fostering preferred values, drawing out and nurturing inherent positive values, and facilitating self-empowerment in learners to develop self-knowledge, deep understanding, and the capacity continually to select and develop their own values through critical thinking, discernment and self-reflection. This has implications for educators themselves becoming self-reflective to understand their own world views, which they unconsciously communicate by their action and behaviour when interacting with learners.

The learning environment

The learning environment featured strongly in the principles of good practice that emerged from the VEGPSP case studies, listed in Appendixes 11 and 12, and from the international documents summarised in Appendix 25. Quality education was represented in these documents as providing a safe, secure, supportive and welcoming learning environment that was inclusive, child-friendly and democratic, in which trust could grow. Emphasis was given to mirroring the values being

taught, in the teaching methods and processes adopted, by promoting democratic participation, inclusive, respectful behaviour, and sustainable practices. Also contributing to quality, was a learning environment that valued and respected diversity, and fostered intercultural understanding, non-discrimination and gender sensitivity.

Alton-Lee stressed the importance of the learning environment, concluding that "effective quality teaching is values-laden, particularly in relation to the learning climate in 'caring, inclusive and cohesive' learning communities" (Lovat, 2007, p. 16). International studies reported that positive learning outcomes occurred in quality learning environments that were safe, welcoming, inclusive, student-centered, participative and non-discriminatory, where teachers had high expectations of students for deep learning, and had positive attitudes towards them (UNICEF, 2000). Environments that were conducive to learning were described as supportive, empowering, rights-based and democratic (Unesco EFA, 2005). A positive learning environment was also fair, promoted cooperation and respect for diversity, and adopted consistent behaviour management approaches that were constructive, preventive, transparent, proportionate, based on natural justice, and focused on helping students to solve problems, make positive decisions and resolve conflicts peacefully (Shannon and Mc Call, 2000). These features of values-based learning environments are also those that are needed for quality, values-based ESD, and reflect global values such as respect, justice and fairness, cooperation and trust.

The role of teachers and positive relationships

Among the common themes in research about the factors that contributed most to quality teaching and learning were teachers themselves, and the values-based learning environment that they engendered.

'what matters most' is quality teachers and teaching. (Rowe, 2003, p. 1)

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Willms (2000), Rowe (2003), and Scheerens (1989) found that teachers had by far the greatest impact on student achievement, especially if they showed care and respect for students, and were therefore liked, trusted and respected in return by learners who were more highly motivated to achieve as a result (Lovat, 2007).

> There is now resounding agreement that what teachers do in the classroom, and the learning environments that they create, does make a difference to student achievement. It is more influential than socio-economic status, the effect of the school, gender difference, principals' leadership and students' backgrounds. (Lovat, 2007, p. 14)

Lovat (2007) found strong links between quality teaching and values-based relationships in the classroom, citing a number of studies, including Bryk and Schneider (2002), who found that the combination of 'relational trust', respect, competence, personal regard and integrity, had a major impact on whole school cultures through values education programs, and Willms (2000), who also found a link between positive classroom values and student achievement (Lovat, 2007, pp. 14-15). Lovat concluded that, "at the heart of teaching and learning are relationships" (Lovat, 2007, p. 135), challenging previous beliefs about the impact of student background on achievement.

It is therefore not only what teachers 'know' and 'do' in the classroom that matter, but also 'who' they are being in authentic relationship with learners. According to Hawkes (2003), modelling is the most important aspect of the teacher-student relationship, and the teacher's "state of being" rather than their "state of doing" is more important (Lovat, 2007, p. 143). What is obvious is that values form the basis of a quality learning environment and that the role of teachers is vital for creating a values-based climate in classrooms where learning is optimised. Given the importance of modelling, relationships and positive learning environments for quality learning outcomes, it makes sense to optimise teacher capacity for deep understanding of values,

and socio-emotional and interpersonal skills, with transformative impacts for teachers, learners and the learning environment.

Values-based learning for Education for Sustainable Development

The VEGPSP studies found that:

> Values-focused pedagogies are required to support students to live as enabled and resilient individuals in the real world of the twenty-first century: a world beset with climate change, personal and societal insecurities, shifting certainties. (Commonwealth of Australia, 2008, p. 29)

Given the complex interplay of factors and influences that lead to the development of values in learners, a brief examination of instructional approaches to values education here identifies methods that may lead to the development of enduring values, transformed behaviours and lifestyles, and responsible action for sustainability.

There has been debate among educators regarding whether values should be: (a) modelled implicitly through the 'hidden' curriculum of the school, or explicitly taught across the curriculum; (b) directly instilled, or drawn from the child's inner knowing; and (c) whether children should receive direct guidance in constructing their values or merely be provided with the skills, capacities and understandings to construct their own chosen values. Various approaches have been applied to the teaching of values, such as: (a) transmission or inculcation of values, accompanied by modelling; (b) moral reasoning and analysis of moral dilemmas, emphasising the cognitive aspect of moral development in learning stages, advocated by Piaget and Kohlberg (1958); (c) the "just community" approach of Kohlberg and Higgins (1987), in which groups of learners developed shared norms; and (d) values clarification, developed by Raths and others (1966), based on critical thinking and affective responses, to facilitate learner exploration and personal choice of values among alternatives, which were affirmed and acted upon (Halstead, 1996, p. 10).

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Each approach made an impact in its own way, however incomplete for not engaging the whole learner. Gilligan (1982) and Noddings (1984) criticised the moral reasoning and "just community" approaches for not taking account of socio-cultural influences on values, nor of the feminine ethic of care, responsibility and love, and for underestimating the need for a basic values foundation before tackling difficult moral dilemmas (Halstead, 1996, p. 10).

Kirschenbaum (1992) considered values clarification to have been implemented erratically and superficially, without adequate research, teacher development and curriculum integration. He also claimed that values clarification had overstated the case for independent thinking and free choice of values, since the values of freedom, justice, equality and other democratic and civic values were implicitly promoted in its goals and methods, and that it encouraged a subjective approach to values, without providing guidance in embracing desirable values (Kirschenbaum, 1992). Halstead agreed that values clarification fostered relativism without recognising that learners could make mistakes in their choices of values if unguided (Halstead, 1996, p. 10). From an ESD perspective, the values clarification approach had merit for the practical and democratic processes used, which reinforced and modelled the values of ESD (i.e. freedom, justice, equality, respect), although more explicit teaching of global values could have had more enduring impact.

At the other end of the spectrum, the direct transmission or inculcation of values that had previously characterised moral or values education in the West, and which remained current in some parts of the world, had the effect of repressing personal choice and individuality, and risked manipulation for political or sectarian interests. In an increasingly confusing and complex world, in which children were confronted with making choices at an ever younger age, it was not enough to exhort learners to reject "bad" values or behaviours and to embrace "good" ones

reinforced by reward and punishment, they also needed to develop the skills to make decisions independently (Kirschenbaum, 1992), which supported Einstein's view that:

> The aim (of education) must be the training of independently acting and thinking individuals who, however, see in the service to the community their highest life problem. (Einstein, 1954, p. 60)

Such skills were developed through dialogical processes of discussion and debate accompanied by opportunities to experience and internalise desired values to be acted upon though service-learning and civic action. This balanced approach both guided learners and enabled choice, while engaging reason and affect, including physically acting upon chosen values.

Towards a comprehensive approach to values education

A combination of approaches, which Halstead called "eclecticism" (Halstead, 1996, p. 10) and Kirschenbaum (1992) called "comprehensive values education", may be effectively applied to values-based ESD, using strategies that are appropriate to each age and ability level. This is also consistent with the IIS, which required "multi-method" and "different pedagogies" to be used for ESD, including those that "model the processes" of sustainable development (Unesco IIS, 2004, p. 16).

Kirschenbaum's approach was comprehensive in content, methods and location, taking place in the school and in community, combining traditional and progressive approaches. The content addressed a wide range of values-related issues and diverse teaching methods, including modelling, instilling and developing skills for independent and responsible decision making. These involved moral reasoning, critical thinking and processes of values clarification, accompanied by practical learning activities entailing affective and skills development (Kirschenbaum, 1992). This approach engaged all three of Bloom's learning domains (Bloom, 1956), cognitive, affective and psychomotor, and brought together the processes of values

clarification with those of moral reasoning, while providing greater guidance in values choice, although limited in scope. A broadening of scope, by applying values considerations to socio-political, cultural, environmental and economic issues, would render Kirschenbaum's comprehensive approach appropriate for ESD.

Furco (2006) also suggested a comprehensive approach to values education that brought together Langer's five moral development perspectives, summarised in Appendix 26 and mapped against Unesco's four pillars of learning, which integrated reasoning with the development of personal traits and social-emotional skills, and with practising values in action through service learning. Halstead agreed that an eclectic approach was needed for values education, which combined "the best of moral guidance *and* values clarification … modelling and imitation; training and habituation; and enquiry and clarification" (Halstead, 1996, pp. 10-11).

The comprehensive approaches proposed by Kirschenbaum (1992) and Furco (2006) are applicable to values-based ESD, with respect to whole person learning, school community engagement, and actioning values in service to the community. However, more may be needed for learners to: (a) have the confidence and skills to critique existing unsustainable practices; (b) find innovative solutions to complex problems by drawing on knowledge from multiple disciplines; and (c) bring about transformative change towards sustainability. For these, greater levels of self-awareness, and higher cognitive skills are required, including critical, trans-disciplinary and systems thinking and creative problem solving.

Extended approaches to values education

For insight into potential new directions for values education appropriate for ESD, Lovat pointed to the work of Dewey and Habermas (Lovat, 2007, pp. 6-9). Dewey believed that society could

be transformed by shaping the "democratic character" and "social spirit" of the child, to enable "self-realization" and effective contribution to community well-being (Morsy, 1997, Vol. 1, pp. 281-282). He believed that self-realisation might be reached by developing abilities for self-reflectivity, inquiry and moral judiciousness (Lovat, 2007, p. 6), for which values-rich learning environments provided fertile ground.

Habermas supported a "more challenging and authentic learning" involving self-reflectivity and "critical knowing", requiring a critical appraisal of knowledge and world views, leading to deep knowing, transformed attitudes and behaviours, and a better understanding of self and others (Lovat, 200 7, p. 6). Lovat claimed that "personal morality is founded on the knowing that arises in the capacity for self-reflection" (Lovat, 2007, p. 24). When combined with "communicative knowledge, capacity and action", which was the understanding, commitment and action that came from engagement with others, the learner developed deep intercultural understanding and a personal commitment to justice and "practical action that makes a difference" (Lovat, 2007, pp. 6-9).

Piaget's principle of "reflective abstraction" was akin to the "self-reflectivity" of Dewey and Habermas, in which an active mind contemplated what it perceived, and observed its own thinking processes in testing ideas and assumptions against existing knowledge and experience. If an idea was confirmed then an internal shift occurred, leading to the construction of new knowledge and meaning (Glasersfeld, 1996). Fostering this process helped learners to understand how personal change and transformation of attitudes and behaviour occurred, that was necessary for understanding how broader change towards sustainability might be brought about in society. Since self-reflective abstraction and self-realisation bring about personal change towards sustainable living, and commitment to practical action towards social change, it is

surmised that the development of the whole learner is necessary for values-based ESD to be both personally and socially transformative.

Assessing the acquisition of values

Although much has been written about **which** values ought to be taught in schools, and to a lesser extent **how** values ought to be taught, little has been written about the **assessment** of the acquisition of values compared to assessment of knowledge and skills. Any serious mandate for including values in education must take account of the assessment of values development. Scriven went so far as to say that a failure to teach values, and presumably therefore to assess them, was "not just cowardice but … professional incompetence" (Scriven, 1966, p. 42). Writing from an Australian perspective, Pascoe considered that ignoring the social and personal development aspects of learning in assessment and reporting "relegates them to a lower level of importance, and limits teachers and schools to addressing in an unplanned fashion, issues of values, personal and social development and generic competencies" (Pascoe, 2005, p. 1).

Although values may be more difficult to assess than testing knowledge and demonstrating skill, it is certainly possible for teachers to observe values, attitudes, dispositions and social competencies in learner actions, behaviour and interactions. Initial work had already been undertaken in this area, upon which to base assessment approaches. Based on her experience of the Values Education Good Practice Schools Project (VEGPSP), Lovell considered that it is not only "possible to assess values, it is also necessary for schools to know" whether their values education programs are "making a difference to young people and their society" (Lovell, 2006, p. 2). Accurate assessment of values depended on the experience, ability and objectivity of teachers, involving potential problems in: (a) determining the data on which assessments were made; (b) identifying and understanding the range of behaviour that reflected certain values; (c)

finding time to conduct and record student observations; and (d) concerns about potential student and parental disagreement with assessments (Pascoe, 2005, p. 8). Pascoe considered that in order to address such problems, "advances in educational measurement should establish assessment in the social domain at the forefront of progressive assessment methodologies", enabling teachers to assess and report professionally on development in the personal and social domains, and schools to evaluate whether they were achieving their goals (Pascoe, 2005, p. 4).

A major evaluation study known as *The Eight-Year Study* (Aikin, 1942), conducted by Smith and Tyler in 30 American schools, identified seven behaviours and verbal responses that indicated an appreciation of reading, and found that behavioural statements and degrees of internalisation of the value of appreciation needed to be highly specific. Bloom (1971) subsequently included values in his affective objectives, defined in behavioural terms and stages for teaching and assessment purposes, providing a foundation upon which to assess values, not often applied in practice. Lewy (1968) developed instruments for measuring affective objectives of appreciation relating to reading, music and mathematics. Numerous other methods and techniques for evaluating affective outcomes were also developed from the late 1960s, which could be revisited for updating and applying to sustainability concerns (Bloom, 1971, pp. 232-244).

Of particular relevance are the various tools, surveys and questionnaires that have been developed in Australia to support the measurement of attitudes and values, such as the Australian Council for Educational Research's (ACER) *Attitudes and Values Questionnaire*, against which schools assessed the social, emotional, moral and ethical development of their students (ACER, 2001). The ACER also conducted an evidence-based pilot project in Western Australia, to assess systemically the interpersonal, moral and ethical aspects of schooling, involving teacher observation, self-reporting and student responses to scenarios (Pascoe, 2005, pp. 5-6). The

development of knowledge and skills was also integrated with dispositions in the *National Assessment Program for Civics and Citizenship* (MCEETYA, 2004), requiring learners to understand and practise civic competencies, while developing and practising citizenship skills, attitudes, beliefs and values for participating fully in democracy (Mellor, 2007, pp. 6-7).

There is potential in Australia for building upon these initiatives, accompanied by additional research, for incorporating the assessment of values in curriculum frameworks.

Developing the whole learner

Education has at different times developed some aspects of the person more than others, whether physical, intellectual, ethical or social, according to the needs of the times. In the West, reason and emotion were both accorded legitimacy for centuries until the Enlightenment, when Descartes and others considered that reason was the only true source of knowledge. Since then, the affective, intuitive, feeling and sensing parts of human nature were not considered valid ways of knowing in the West, contrasting with Eastern thinking, which emphasised relationships, context and dialectical reasoning (Nisbett, 2009, pp. 153-170). However, changes are occurring in many fields, including in psychology and education, led by Nobel Laureate, Kahneman (2011), who clearly explains how the two systems of thinking, intuitive-emotional and rational-logical, can best work effectively together to inform judgements and decision-making, with significant implications for education.

The development of the whole person through education was advocated at various times throughout history by philosophers and educators such as Avicenna, Rousseau, Pestalozzi, Fröbel, Dewey, Steiner, Montessori, Jung, Maslow, and Gardner. Dewey considered the task of institutions was to contribute to the "all-round growth of every member of society" (Kessler,

2000, p. 159), and that education played a role in enabling learners to contribute and participate fully in civic life. He thought society could be transformed by shaping the child's character towards self-realisation, given the appropriate social and co-operative learning environment (Morsy, 1997, Vol. 1, pp. 281-282).

The Faure report considered the fundamental aim of education to be the development of the whole person, "physical, intellectual, emotional and ethical" (Faure, 1972, p. 156) for bringing about positive societal change. The Delors report later also recommended that education could "contribute to the all-round development of each individual – mind and body, intelligence, sensitivity, aesthetic sense, personal responsibility and spiritual values" (Delors, 1996, p. 94). The interrelatedness of "thinking, feeling, perceiving and intuiting in the process of learning" was recognised more recently by Zohar and Marshall (2000), calling for a humanistic pedagogy to engage the whole learner (DECS, 2006, p. 10).

Numerous international documents have attested to the need for the development of the whole child, such as Articles 27 and 32 of the Convention on the Rights of the Child, which emphasised holistic child development as a right (OHCHR, 1990), and the World Programme on Human Rights Education (WPHRE), which affirmed the need to "give equal importance to cognitive (knowledge and skills) and social-affective (values, attitudes, behaviours) learning outcomes" (OHCHR, 2006, p. 46).

The IIS considered the work of educators to be "helping individuals to grow and develop intellectually, emotionally, spiritually or practically" (Unesco IIS, 2004, p. 15), leading to the personal and collective transformations required for sustainability. A values-based approach to ESD developed the cognitive, affective and functional capacities of the learner, which together

provided the motivation and drive for personal transformation, and for taking action for societal

change. These principles were also reflected in relevant Australian policy documents, such as

Living Sustainably. The Australian Government's National Action Plan for Education for

Sustainability:

> Education for sustainability is not simply about providing information but involves
> equipping people with the skills, capacity and motivation to plan and manage change
> towards sustainability. (Commonwealth of Australia, 2009a, p. 9)

Some whole person competencies are listed in Appendix 27, showing the relationships between

the ESD knowledge, skills and values recommended in the IIS with respect to: (a) systems and

critical thinking; (b) creative problem solving; (c) commitment to equity, justice, inclusion, and

respect; and (d) the application of knowledge to practical action (CEL, 2008).

The need to develop the whole learner, including the spiritual dimension, can also be found

reflected in Australian educational policy documents, such as in the 1999 and 2008 statements

on national goals for schooling:

> Schooling provides a foundation for young Australians' intellectual, physical, social,
> moral, spiritual and aesthetic development. (MCEETYA, 1999)

> Schools play a vital role in promoting the intellectual, physical, social, emotional, moral,
> spiritual and aesthetic development and well-being of young Australians.
> (MCEECDYA, 2008)

Very little has been written about spiritual development in education outside a religious context.

McGettrick (1995, p. 2) considered that spirituality was about self-examination and formation of

the inner self, akin to Habermas and Dewey's notions of self-reflectivity and self-understanding,

in order to understand and relate better to others. Hay and Nye's research (2006) confirmed the

relational nature of child spirituality as inter-personal, intra-personal and reflective, extending to

all life, and having a strong motivating power and altruistic effect, which generated meaning and

moral insight (Hay and Nye, 2006).

Hay and Nye found that spirituality in children not only generated an interest in values, such as generosity, care, compassion, responsibility and gratitude, and a desire to be of service to others and to the natural world, but also a reverence for life leading to environmental action (Hay and Nye, 2006):

> Spirituality is the bedrock on which rests the welfare not only of the individual but also of society, and indeed the health of our entire planetary environment. (Hay, 2006, p. 141)

Beare and Slaughter considered that spirituality ought to "underlie and interpenetrate" school curricula (Beare and Slaughter, 1993, p. 48). The related values were linked with: (a) whole person and spiritual development; (b) an inner personal search for identity, meaning and purpose; (c) connection with others (d) the ability to contribute, be of service to others, and be part of something larger (Kessler, 2000). In the Australian setting, Hill (2004, p. 12) argued that the individual's "search for personal meaning and significance, far from being peripheral to the school's task, is central".

During the course of the Values Education Good Practice Schools Project (VEGPSP), participants discovered that values education was about whole person development, thinking, and acting upon values while contributing to their community:

> Values education ultimately is about engaging: the head – cognitive understanding and intellectual analysis or critiquing of values and espoused value positions (i.e. thinking); the heart – being motivated and desiring to adopt the values (i.e. desire); and the hand – the necessity to engage in opportunities to practise and demonstrate espoused values (i.e. action). (Commonwealth of Australia, 2006, p. 32)

The VEGPSP findings apparent in the Australian context, thus highlighted the need for a balanced approach to values education which engaged all of Bloom's learning domains, addressed holistically and not separately, namely: (a) the cognitive domain (i.e. knowledge, understanding, analysis, application and synthesis) for moral reasoning; (b) the affective domain (i.e. feelings, emotions, attitudes and values); and (b) to some extent, the psychomotor domain,

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since learners needed skills to put certain values into practice, for example, in the conservation of the physical environment. The three learning domains are inseparable, as are the various dimensions of learners, with inextricable connections between thinking, knowing, doing, being, valuing and creating meaning, in ways that are impossible to disentangle. It has been argued that, "values have a rational or cognitive element … an affective element … and a volitional element", but that there was a need to understand better how the three elements were linked in teaching and learning (Ainley, 1998, p. 142).

Values are involved in thinking and making judgements, moral reasoning, problem solving, decision making and in the creation of meaning, but they also involve emotions and feelings about issues such as, environmental destruction, species loss, human suffering, conflict, violence or injustice. Values motivate actions and the desire to learn new skills, including the urge to contribute, to be of service to society or to care for the environment, helping others and bringing about positive change. Since values are closely related to all three domains, there are implications for holistic and constructivist teaching processes that provide opportunities to explore values cognitively, emotionally and in practice through diverse learning experiences that also accommodate learner differences.

Cognition and reflection on ideas and experiences, engage reciprocally with emotional responses to these, through an internalising psychological process as the learner tries to make sense of the world, integrating new knowledge with what is already known or experienced. This process may include hopes, aspirations and visions of potential futures based on perceptions, observations and priorities, leading to revised conclusions about reality, new solutions to problems, and altered choices for action towards preferred futures motivated by emotions. Teaching and learning processes that integrate the affective domain with action and cognition, assist learners to

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internalise desirable qualities and to live by positive values, as visions of diverse ways of being are tested internally for a positive fit with their values and feelings. Some ways of being may be tested through action, and rejected according to emotional responses until a more appropriate way is found. Choices may alter as knowledge grows, as contexts change, and as learners continue to mature and develop.

Cognition, affect and action were therefore intertwined in the learning process, forming the basis for values-based, critical thinking, action learning and problem-solving, forming a triple helical spiral that represented the lifelong developmental process to more complex levels of learning, as envisioned by Kolb (1984). The paths taken can vary from one individual to another, depending on learning preferences, prior experiences, individual capacities, age or stage of development, and many other social and contextual factors that cannot easily be predicted.

Differences between learners have been highlighted by many educators and theorists, such as Kolb (1984), who acknowledged differences in learning preferences, and Gardner (1999), who identified eight dimensions of 'multiple intelligences', linked to learning preferences. Gardner later considered adding 'existentialist' intelligence, reflecting a concern with ultimate issues of being, and 'moral' intelligence, relating to attitudes towards the sanctity of life. Gardner concluded that it was necessary to, "figure out how intelligence and morality can work together … to create a world in which a great variety of people will want to live" (Gardner, 1999, p. 4), further highlighting the need for integrating values with cognition in the learning process. Most recently, Gardner (2011) argued for the reintroduction of the virtues in education, such as 'truth', 'beauty' and 'goodness'.

Goleman (1995 and 2006) wrote about the development of 'emotional' and 'social' intelligences, while Zohar (2000) focussed on 'spiritual' intelligence, and Arnold (2005) on 'empathic' intelligence. These and other views of diverse learning styles, preferences, and intelligences, highlight the need for diversity in teaching methods to accommodate difference and to expand capacities.

Since it is unrealistic to expect learners to develop equal facility with all modalities and intelligences, learners need opportunities to work cooperatively and complementarily with others who have different preferences and capacities, while respecting mutual strengths. This enables cross-fertilisation of ideas from diverse perspectives and the application of a range of abilities to problem solving, more likely to generate innovative solutions, while continuing to foster excellence in single or few modalities among the specialists and the gifted. Such cooperative team learning may facilitate trans-disciplinary understanding and problem solving, so important for ESD.

Various educational theorists had emphasised particular aspects of child development over others, some arguing that learning originated from action or experience, while others maintained that knowledge and information were processed first then applied. Some learners have been observed to learn randomly, tackling the whole task at once, while others learnt sequentially in a linear fashion, one-step-at-a-time. Given what was known about diverse learning styles and preferences, a diversity of teaching methods needed to be used in the classroom, so learners might acquire knowledge, skills and values in different ways, and continually broaden their capabilities, consistent with the IIS proposal for ESD to adopt "multi-method" teaching approaches (Unesco IIS, 2004, p. 16).

The issues being raised here offer insights into learning, which together address the development of the whole child, encompassing all dimensions, capacities, intelligences and preferences. In summary, for learners to reach their maximum potential, to participate in and contribute fully to society, and to find innovative solutions to complex, interconnected and multidimensional local and global problems, they need the opportunity to develop each aspect of themselves, and to find and apply their particular gifts and talents for personal satisfaction and societal well-being. Societal transformation depends on the holistic and personal development of learners, inspired by the positive vision of a sustainable future, for them to realise their potential as active and responsible citizens with the capacity to bring about change.

Education for societal change and transformation

> Education for Sustainable Development is transformative education at heart. (Unesco, 2010, p. 4)

This quote encapsulates the global vision of values-based ESD as "the primary agent of transformation towards sustainable development" (Unesco IIS, 2004, p. 15), and as creating "positive societal transformation" (Unesco IIS, 2004, p. 23).

> Education must inspire the belief that each of us has both the power and the responsibility to effect positive change on a global scale. (Unesco IIS, 2004, p. 15)

ESD placed values at the centre of an educative process that was both transformative of learners and enabling of societal transformation. Values of justice, peace, care, and respect among people and for their environment, which characterised relationships based on deeper understandings, were portrayed in the IIS as key to societal transformation for sustainable development (Unesco IIS, 2004, pp. 14-16).

Education about the nature and processes of transformative development, were also presented in the IIS as being essential for understanding how to bring about constructive social change, cooperatively and creatively for a sustainable society.

> The development perspective – that of social change and evolving circumstances – is also central to any treatment of sustainable development. (Unesco IIS, 2004, p. 16)

The usual processes of incremental social, political and structural change are too slow to address rapidly accelerating climate change and increasing conflict levels. Ongoing educational reform cannot, in sufficient time, bring about the fundamental changes in perception, systems of thinking, and approaches to problem solving needed for a sustainable future. Only a deliberate and immediate approach to transforming the very nature of education itself can generate the personal and collective paradigm shift and global mind-set towards whole systems thinking needed to transform lifestyles and work practices for sustainability, in educational institutions, in the workplace and in community.

It is argued in Chapter 4, that education had undergone processes of reform and transformation in times of crisis and change, albeit not as rapid or dramatic as those faced today. At this time education required "a metamorphosis into something very different" involving "*trans*-formation" not "*re*-formation" (Yero, 2002, p. 245). Sterling referred to the need for "third order change" involving "whole systems thinking" for a transformative approach to sustainability education that engaged the whole person and the whole school community (Sterling, 2001, pp. 60-61). While first order change adjusted and improved the existing system incrementally and methodically, and second order change shifted the way education was viewed through deep reflexivity, third order learning was epistemic, reflecting a participative, ecological, and relational world view, which brought together all three levels of change and went beyond them (Sterling, 2003, pp. 347–350).

Sterling described a "double learning process" for education to "engage in deep change in order to facilitate deep change … to transform in order to be transformative" (Sterling, 2001, p. 15). Shaeffer (2007b) argued that a third learning process be added, for learners to experience self-transformation in their thinking, being and doing for learning **how to transform** their community or workplace. The IIS supported this view, stating that ESD needed to enable "active participation in seeking and implementing new patterns of social organisation and change" (Unesco IIS, 2004, p. 15).

In Australia, a sustainability action process for learners to initiate change, was outlined in a guide for curriculum developers in a series of steps, representing the only resource found to support educators in teaching learners how to create change (Commonwealth of Australia, 2010, p. 9). In order to create transformation, an understanding of transformative processes is required by both teachers and learners, beginning with personal and systemic transformation. Sterling claimed that "the highest level of learning is 'transformative' because it touches, engages and changes deep levels of values", such as trust, care and respect, integral to positive relationships (Sterling, 2001). Lovat found that the VEGPSP case studies contained accounts of transformation, both personal, among teachers and learners, and across the school community, and that values supported teaching in being genuinely transformative (Lovat, 2007, p. 159), accompanied by the development of knowledge, skills and opportunities to practise the values in action. Values-based learning therefore not only contributed to quality education and enhanced achievement, it also had a transformative impact on learners through what Lovat called "the positive dynamic interplay of intellect and affect" and Johnson labelled a "metacognitive-affective" approach to values education (Lovat, 2007, pp. 26-27). Habermas argued for the blending of intellectual depth with "communicative capacity" and "self-reflection" for development of a "social conscience" leading to action for change (Lovat, 2007, p. 24), while

Ellyard called for "self-transformation" to be "the initial component of any transformation process" (Ellyard, 2001, p. 72).

For learners to engage in the self-reflectivity necessary for self-realisation and personal transformation, teachers themselves needed to be comfortable with, and experienced in, the processes involved. On this issue, Dewey considered that "the cultivation of a mindset on the part of teachers that was … self-reflective", while also instilling "self-reflectivity, inquiry and a capacity for moral judiciousness" in learners, was necessary for deep knowing and understanding to occur (Lovat, 2007, p. 6). A critical, self-reflective way of knowing involved teachers questioning their own values and assumptions, so that values education did not merely "confirm the values and beliefs of the dominant class" to which the teachers themselves might belong (Lovat, 2007, p. 6), but also promoted critical inquiry. Hence transformation begins in schools, with teachers and learners, before they can be expected to be agents of change in their classroom, school, family, community and workplace.

Many theorists agreed that the nature and processes of transformation could be complex and elusive, but that central to transformation was a fundamental change of consciousness, or a paradigm shift that significantly altered underlying assumptions and values towards a global, holistic and systemic worldview (Beare (1993), Colins and Chippendale (1995), Slaughter (1999), Mezirow (2000), Ellyard (2001), Sterling (2001), and O'Sullivan (2003). Sterling also developed a comprehensive argument for transforming consciousness towards a holistic and systemic world view, which combined systems thinking with ecology, and critical thinking with a sense of connectedness, blending "ethical, spiritual, cultural and ecological judgement criteria … with practical, economic, social and political dimensions" (Sterling, 2003, p. 38), consistent with the vision for ESD in the International Implementation Scheme (IIS).

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This process involved three levels of transformation, which Sterling referred to as: (a) "epistemology", or ways of **knowing**, thinking and perceiving the world, not as a collection of separate parts, but as an interconnected whole; (b) "ontology", or ways of **being** in the world, socially, emotionally spiritually and ethically, in cooperation and in harmonious relationship with others and with all life; and (c) "methodology" or "functionality", having the courage, commitment and skills to take **action** in partnership and cooperation with others, in accordance with deeply held personal and global values and a holistic mindset, directed towards collective well-being. These three levels, which parallelled Unesco's pillars of learning to **know**, to **do** and to **be**, interacted for third order change, involving a participative, ecological and relational world view (Sterling, 2003, p. 350), towards learning to **live together** sustainably with others.

Beare had supported these three levels of knowing, being and doing, since they empowered learners to shape their future by: (a) a holistic understanding of their society and global processes; (b) self-knowledge, reflexivity, empathy, awareness and clarity about values, meanings and purpose; (c) understanding and critiquing images of preferable and realistic futures; and (d) developing and applying skills of self-mastery (Beare, 1993, pp. 127-128). Colins had advocated a similar set of capacities, namely: (a) imaginal, (b) interpersonal, (c) instrumental, and (d) system skills (Colins, 1995, pp. 113-115).

A comprehensive approach to transformation therefore goes beyond the personal to involve four levels of change: (a) at the individual level, for both educators and learners, which is then reflected in their families, personal lifestyles and work practices; (b) at the systemic level and in schools; (c) at the collective community and societal level; and (d) at the global level. The second and third levels of transformation involve engaging the whole school community in ESD, linking individual with school and community development, by means of a shared values-based

ethos reflected across all aspects of school life involving cooperative activity towards sustainability.

Engaging the whole school community in Education for Sustainable Development (ESD)

Since the social reforms of the 1960s, education progressively became a tool of government social and economic policy for addressing developmental issues, necessitating school community engagement (Connell, 1980, pp. 9-11), reflected in Australian schools that participated in the Australian Sustainable Schools Initiative (AuSSI), in the VEGPSP and in Global Education programs.

The International Implementation Scheme (IIS) emphasised schools as important places for dialogue, interaction and partnerships with other community organisations, for learners to explore local issues while drawing on local knowledge (Unesco IIS, 2004, p. 21), recognising that ESD took place in "all possible spaces of learning, formal, non-formal and informal" (Unesco IIS, 2004, p. 5). The IIS also saw the potential for learning sustainable practices and behaviours, individually and collectively, in cooperation with others, beyond the classroom, at home and in the community (Unesco IIS, 2004, pp. 20-21).

Whole school approaches to ESD have been described in numerous documents, both in Australia and internationally, including in the Asia Pacific Regional Strategy for ESD, which saw ESD as being central to the school context (Unesco Bangkok, 2005a, p. 8), and in the World Programme for Human Rights Education (WPHRE), which emphasised the need for an "environment where human rights are practised and lived in the daily life of the whole school community" (OHCHR, 2006).

In Australia, the National Framework for Values Education (NFVE) advocated a whole school approach to values education, stressing the importance of partnerships with parents and the local community, and of articulating and consistently applying the values of the school community (DEST, 2005). The NFVE described whole school approaches as the application of values education priorities to: (a) school curriculum provision, (b) structures and policies, (c) procedures and rules, (d) funding priorities, (e) decision making processes, (f) disciplinary procedures, (g) community relations, and (h) pastoral care (DEST, 2005, pp. 3-6). Shared values were to be determined in consultation with school communities and incorporated in the "school's mission or ethos" and in "school policies and teaching programmes" (DEST, 2005).

In 2005, a whole school approach to Education for Sustainability (EfS) was also advocated in the *National Environmental Education Statement for Australian Schools* (DEH, 2005, pp. 10-12), and was practised by participating AuSSI schools, the features of which are discussed in Chapter 5 and listed in Appendix 15. AuSSI Schools became sites for showcasing good practice in sustainability, not just for learners and educators, but for the whole community.

Involvement of the community in school-based activities can shift schools beyond improvement to transformation, for which students may assume leadership roles as part of their practical experience. The key to transformation is to engage authentically and democratically with the school community in collective dialogue and shared activity. Fullan argued that a commitment to sustainability and transformation needed to go beyond even the whole school community, and to be extended to schools in the surrounding district, which occurred among the many district-based school clusters engaged in the Australian Values Education Good Practice Schools Project (VEGPSP) (Fullan, 2005, p. 68). Whole school approaches to ESD emphasised transformation of the school ethos, re-orienting it towards sustainability, permeating policy, practice, teaching and

learning, and community engagement. These features characterised Sterling's vision of 'sustainable education', which he defined as "a change of educational culture which both develops and embodies the theory and practice of sustainability" throughout the school (Sterling, 2001, p. 22), while making a positive impact on the wider society.

An international review of international experiences of whole school approaches to sustainability, conducted by the Australian Research Institute for Environment and Sustainability (ARIES), found that the following key features were common to 'sustainable schools' that both modelled sustainable practices and taught sustainability, namely: (a) democratic and whole school decision making processes; (b) leadership that placed sustainability at the centre of school planning and practice; (c) whole school participation in school action and improvement plans, including greening of the school grounds; (d) broad community, family and stakeholder partnerships; (e) key sustainability ideas reflected implicitly through the hidden curriculum and supported by the taught curriculum, through which education for sustainability was integrated, using participatory learning approaches; (f) reducing the school's ecological footprint; (g) teacher research and reflective practice; (h) professional development for all staff and partners; and (i) regular monitoring, reflection and evaluation to inform future practice (Henderson, 2004, p. 44). In effect, 'sustainable schools' became learning organisations at the centre of a learning community, focused on sustainability.

The ARIES report asserted that Education for Sustainability (EfS) differed from previous Environmental Education (EE) programs, in that the emphasis moved beyond what was taught, to "seeing schools as a focal point where children, adults and the community interact and learn together" (Henderson, 2004, p. 8). It also acknowledged the need to "orientate whole school programs towards integrative and transformative approaches to sustainability", emphasising the

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importance of partnerships to the success of whole school community approaches (Henderson, 2004, pp. 44-46). This has implications for incorporating the ability to form partnerships, work cooperatively, and participate in constructive civic, environmental, and social action with others, in the development of skills for ESD.

ESD therefore involves much more than what occurs in the classroom, since it needs to be reinforced and modelled throughout the school with the involvement of the broader community, which in turn also benefits, both directly and indirectly, from school-based partnerships and participation.

Conclusion

There is no doubt that quality ESD includes values that are nurtured in conducive environments, characterised by positive relationships, which are reinforced across the whole school. Values are also integral to whole person development, raising future leaders equipped to deal with complex, interdependent problems, and to bring about the transformations required for a sustainable future. Central to a quality approach to ESD is a curriculum framework that, in addition to values, enables the holistic acquisition of knowledge and skills, structured in ways that foster integrated understandings of systemic issues that enable complex problem solving.

The next chapter explores the specific knowledge and skills that are applicable to ESD, and how these may be integrated in school curricula for a systemic and trans-disciplinary approach to learning. It also brings together the key characteristics of ESD to form a comprehensive set of evaluative criteria for ESD, to assist curriculum development and evaluation.

CHAPTER 8:   **CURRICULUM FOR A SUSTAINABLE WORLD**

Introduction

With the explosion of information in the Knowledge Age, school curricula became overcrowded, and curriculum frameworks were re-designed to foster the core underpinning knowledge and skills for lifelong learning. Content needed to be balanced with the processes of teaching and learning to provide the "instruments of knowledge … (for) learning to learn" (Delors, 1996, pp. 86-87), and for accessing and creating knowledge when needed. The International Implementation Scheme (IIS) reflected the importance of lifelong learning in the description of the key characteristics of Education for Sustainable Development (ESD), with implications for the development of core knowledge and skills, and for how curriculum frameworks needed to be structured (Unesco IIS, 2004, pp. 5-6).

This chapter examines the knowledge and skills needed for ESD, and the ways to integrate these in school-based curricula. Some of the key features of ESD are discussed here and summarised alongside other quality characteristics of ESD discussed in earlier chapters, to form a set of criteria for designing and evaluating ESD policy, programs and curricula.

Knowledge for Education for Sustainable Development

The creation of a sustainable future involves working cooperatively to question existing knowledge and work practices, and to develop and apply new knowledge for creatively solving complex and interconnected problems. In order to do this, learners need to develop the knowledge tools and processes to think critically, creatively and systemically, and to analyse and synthesise information across disciplines, to seek innovative solutions and to make values-based choices and decisions. These cognitive and functional skills and practical experiences need to be

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acquired and applied to locally relevant issues linked to global concerns. The education system is charged with the task of specifying the development of these abilities in a coherent curriculum framework for teachers to implement in practice.

The IIS gave examples of ESD content and issues to be addressed in educational curricula, as a guide for educators to adapt to the varying priorities of each context, without being fixed or comprehensive. While many of these issues overlap, they are nonetheless categorised in Appendix 28 by the four ESD dimensions. Such categorisation can be problematic, since the IIS required ESD to be holistic, integrated and trans-disciplinary, and the cultural dimension was to underpin the other three dimensions, providing the context within which ESD occurred, rather than a separate content category. On the other hand, without a checklist of issues relating to each dimension, educators do not have a starting point to guide them in selecting locally relevant content for ESD, as called for in the IIS (Unesco IIS, 2004, p. 20).

Unesco commissioned a team of researchers to identify an indicative list of core priority issues for ESD specific to the Asia Pacific region that are listed in Appendix 29. Some of these were addressed in the IIS, but others that were of priority in the region were added, such as malaria eradication, media literacy, sanitation, public infrastructure, interfaith understanding, sustainable futures and recycling, including some that were classified as cross-cutting themes for integrated treatment.

Since sustainability issues are influenced by time, space, enviro-geographical and socio-cultural context, each region needs to identify key issues of concern for inclusion in ESD:

> The specific content of curricula will be derived to a large extent from the local context, addressing issues of relevance and urgency. (Unesco IIS, 2004, p. 20)

Some problems are common to all countries, such as climate change and pandemic, for example, while others may be country specific, such as migration, Indigenous issues, food and water shortages, drought, volcanic activity, and tsunamis, to name a few.

Educational leaders must decide which issues to include in curricula based on national or local priorities, linked nonetheless to global concerns. In a large continent such as Australia there are shared national issues such as the rights of Indigenous peoples, migrants and refugees, but also local concerns, including desertification, fire, noxious weeds and pests, and the critical issue of water, involving drought or flood, with regional variations.

Several Australian documents have outlined key sustainability issues to be addressed through education, such as the *National Environmental Education Statement for Australian Schools*, which contained the sustainability issues to inform curriculum content in Australian schools (DEH, 2005, pp. 16-17). These are summarised and tabled in Appendix 30 according to four dimensions of sustainability, with the cultural aspects of sustainability listed within the social dimension. While the issues were referred to as 'content' in the document, some actually involved global values (e.g. respect, tolerance), and others related to skills development, such as conflict resolution, natural resource accounting, cost-benefit analysis, and decision making.

Cross-dimensional knowledge and understandings were also listed in the framework, including the "interrelated nature and function of ecological, social, economic and political systems" (DEH, 2005, pp. 9-17), indicating a proposed integrated approach to sustainability, albeit described as 'environmental' education (EE) for a sustainable future (ESF). This contrasted with the later *National Action Plan for Education for Sustainability*, which predominantly contained an environmental focus, placing emphasis on climate change, water shortages, biodiversity loss

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and energy efficiency (Commonwealth of Australia, 2009a), without however, addressing the socio-cultural and economic issues called for in the IIS.

A document published in 2010, entitled *Sustainability Curriculum Framework. A guide for curriculum developers and policy makers,* provided a framework describing what students needed to learn to live sustainably, for guiding curriculum developers and policy makers in the integration of sustainability in the Australian National Curriculum (Commonwealth of Australia, 2010, pp. 13-35). The issues represented in the framework, which are summarised in Appendix 31, were more detailed than those listed in Appendixes 28, 29 and 30 from the documents mentioned earlier (i.e. the IIS, the Asia Pacific priorities, and the 2005 National Environmental Education Statement), and were not divided according to the four ESD dimensions. Instead, the framework categorised the content in terms of 'ecological' and 'human' systems, nonetheless emphasising environmental sustainability with a scientific focus.

The sustainability issues listed in Appendixes 28 to 31 are synthesised in Appendix 32 to form a comprehensive list of issues and knowledge to inform curriculum content for ESD, which also imply some of the skills needed to address them, such as conflict resolution, citizenship, participation, and decision making. Also implicit in the issues are values such as respect, tolerance, peace, equity, and equality, to name only a few.

Skills for Education for Sustainable Development (ESD)

Unlike the local and regional issues that inform ESD curriculum content, ESD skills are not context-specific. They remain relatively consistent regardless of the geographic or social environment, making it possible to be more specific about which skills are most conducive to creating a sustainable society.

The IIS called for a review of existing educational curricula to re-orient education towards sustainability and to foster skills for lifelong learning and for:

> creative and critical thinking, oral and written communication, collaboration and cooperation, conflict management, decision-making, problem-solving and planning, using appropriate ICTs, and practical citizenship. (Unesco IIS, 2004, p. 20)

According to the IIS, learners needed to be able to (a) search out and apply knowledge; (b) think critically, creatively and analytically; (c) advocate for sustainability action; (d) make decisions and solve problems; (d) develop life and work skills; (e) acquire the skills to continue learning actively throughout life; and (f) work cooperatively with others (Unesco IIS, 2004).

Other skills important for ESD that were implied but not explicitly prescribed in the IIS, were integrated systems thinking and the ability to connect knowledge across disciplines to create new knowledge and solve problems innovatively, consistent with an "interdisciplinary and holistic" approach to ESD (Unesco IIS, 2004, p. 4). Also implied was the ability to bring about positive change by learning the "values, behaviour and lifestyles required for a sustainable future and for positive societal transformation" (Unesco IIS, 2004, p. 4). The ESD skills addressed implicitly or explicitly in the IIS are listed in Appendix 33, divided into cognitive and practical functional skills. An analysis of the skills in Appendix 33 reveals an emphasis on cognitive skills, while the functional skills are predictably focused on communication and action for sustainability. Since the examples of skills mentioned in the IIS were not intended to be comprehensive, additional sustainability skills are collated from other relevant documents discussed here, to develop a more complete list of skills needed for ESD.

McKeown (2002) identified a range of skills in the *Education for Sustainable Development (ESD) Toolkit*, which was subsequently adopted by Unesco as part of the international strategy for reorienting education to sustainability. These are listed in the left-hand column of Appendix

34, revealing a similar emphasis to the IIS on cognitive skills, with functional skills associated with action and communication. In a later article, entitled *Quality Education for Sustainable Development*, McKeown added "life skills" consistent with the *EFA Dakar Framework for Action* (Unesco Dakar, 2000), encompassing both "practical skills and psycho-social abilities" (McKeown, 2005, pp. 1-2). These are listed in the right-hand column of Appendix 34. McKeown also sought to categorise some of these sustainability skills using the Unesco four pillars of learning as: learning to know skills (i.e. cognitive), learning to do skills (i.e. practical), learning to be skills (i.e. self competence), and learning to live together skills (i.e. interactive), thereby supporting curriculum developers to integrate ESD skills in ways that addressed the development of the whole learner, "intellectually, emotionally, spiritually or practically" (Unesco IIS, 2004, p. 15).

Several Australian documents mentioned earlier, also identified skills for sustainability, namely: (a) the 2005 *National Environmental Education Statement for Australian Schools*, (b) Australia's 2009 *National Action Plan for Education for Sustainability*, and (c) the 2010 *Sustainability Curriculum Framework*, each of which is discussed here. Like McKeown, the *National Environmental Education Statement for Australian Schools* attempted to classify learning for sustainability according to four categories that overlapped with the Unesco four pillars of learning as follows: (a) the autonomous, self-directed learner, motivated to take action for sustainability; (b) the reflective and deep thinker, who made sense of and understood the complexity of environmental concepts and the interdependence of ideas underpinning sustainability, requiring "deep understanding", "higher-order thinking" and "critical thinking" about environmental education ideas, communicated clearly and confidently; (c) the ethical and responsible citizen and decision maker, who: (i) considered social justice issues; (ii) was empathetic to others; (iii) valued diversity; and (iv) acted with moral autonomy for a just and

equitable society; (d) the relevant and connected learner, who was interested, enthusiastic and able to work with others, engaged in environmental problem solving, formulating constructive futures; and (e) the learner who considered the consequences of applying scientific and technological innovations (DEH, 2005, pp. 18-19).

Australia's *National Action Plan for Education for Sustainability*, identified a set of underpinning principles for Education for Sustainability (EfS) that implied a range of sustainability skills such as: (a) systems thinking, critical thinking and reflection "to understand connections between environmental, economic, social and political systems"; (b) the ability to plan, manage, and participate in change and transformation; (c) the improvement of communication for building networks, partnerships and relationships; (d) the ability to continue learning throughout life; and (e) the development of a "shared vision for a sustainable future" (Commonwealth of Australia, 2009a, p. 9).

The subsequent 2010 *Sustainability Curriculum Framework*, divided sustainability skills into two categories of cognitive and action skills. The cognitive skills, termed "repertoires of practice" consisted of three areas, namely: (a) world viewing, which involved "reflecting on, comprehending, negotiating and changing fundamental beliefs, perceptual orientations, ethical principles and values"; (b) systems thinking, which included understanding and working with complexity, uncertainty and risk; and (c) futures and design thinking, which involved "visualising, modelling, selecting and developing ideas (and) … formulating viable solutions" for a sustainable future (Commonwealth of Australia, 2010, p. 10).

The action skills were contained in the "sustainability action process", which outlined a sequence of steps and practices required to take action for sustainability, increasing in sophistication with

each year level, involving both cognitive and practical skill development. The process began

with making a case for change by exploring options, defining the scope for action and

developing a proposal, and ended with the implementation and evaluation process. This was the

only example found that described the skills and cognitive processes needed by learners to bring

about positive change towards sustainability (Commonwealth of Australia, 2010, p. 9).

The sustainability skills in these three Australian documents were more comprehensive than in

either the IIS or the McKeown documents. For example, they added cognitive skills of deep

reflection and higher order thinking, but also covered many similar skills, such as

communication, critical thinking, systems and futures thinking, creating change, cooperation and

active participation. There was also a reasonable balance between cognitive, practical, social and

personal skills, but with greater attention given to the application of sustainability skills to

environmental concerns, notwithstanding some references to cultural and social justice issues.

The collated sustainability skills from these three Australian documents are synthesised with the

IIS skills and with McKeown's sustainability skills, to form a comprehensive matrix of ESD

skills categorised according to the Unesco four pillars of learning, presented in Appendix 35. It

is evident from the matrix that cognitive, or 'learning to know' skills are by far the most

numerous, followed by practical, action-oriented 'learning to do' skills. There are overlaps

between skills for 'learning to be' and for 'learning to live together', some of which are actually

values, such as respect, empathy, compassion, and cooperation.

The values and content for ESD discussed previously, are not categorised according to the

Unesco four pillars of learning, because ESD values fall naturally into the pillars of 'learning to

live together' and 'learning to be', while most curriculum content logically fits within the

'learning to know' pillar. As with ESD content, values are implied in some ESD skills, such as cooperation and creativity, in acknowledgment that values require both knowledge and skill to be applied confidently.

Integrated, trans-disciplinary curriculum for Education for Sustainable Development

ESD involves developing the ability to perceive and understand complex interconnected patterns and relationships between elements in a system, and to synthesise information based on these linkages across bodies of knowledge, in order to solve problems, while being cognisant of the complex web of consequences to decisions and actions (Patsula, 1999). But educational curricula are generally not structured in ways that enable systemic thinking and integrated learning. This is the result of a longstanding tradition that is proving difficult to change.

The consequences of fragmented knowledge

The process of dividing disciplines and compartmentalising knowledge began during the Enlightenment, as empirical scientific reductionism progressively fragmented knowledge and reality to study and understand it, to the extent that the study of parts came to dominate the whole in Western thinking. Scientific reductionism supplanted the previous organic, holistic and interdependent ways of knowing with a new model for thinking, which has been described variously as reductionist, positivist, materialist, objective, rational, empirical, and focused on quantitative analysis (Beare, 1993, pp. 97-99). Although 'scientism' undeniably had played an important role in human development, it should not be the only method of knowledge generation and validation (Beare, 1993, p. 59).

The implications of the great schism that occurred between the natural and social sciences was well described by Snow (1963), who considered that the breakdown of communication between

the "two cultures" made it difficult to solve the world's problems, while others thought that the consequent fragmentation of knowledge and thinking led directly to contemporary global problems.

Sterling (2003, p. 39) argued that the 'scientism' world view pervaded Western consciousness and became "culturally engrained" to the extent that most people were unaware of it, integrated as it was within the trained structures of thinking, that arose from an education system based on its principles. He considered that:

> The world is a complex, interconnected, finite, ecological-social-psychological-economic system. We treat it as if it were not, as if it were divisible, separable, simple and infinite. Our persistent, intractable, global problems arise directly from this mismatch. (Sterling, 2003, pp. 39-40)

According to Beare, schools reproduced this fragmented and "distorted world view" in what they taught and how they taught it, with a non-coherent "bits-and-pieces" approach, making it difficult to identify relationships between subject areas (Beare, 1993, p. 61).

Rapport saw trans-disciplinarity as an "antidote to fragmentation" of knowledge (Somerville and Rapport, 2000, p. 10), as did Max-Neef:

> New challenges inevitably compel us to adopt trans-disciplinary approaches … we are rarely analyzing a specific problem but instead a web of complex issues that cannot be resolved through the application of conventional policies founded upon reductionist disciplines. (Max-Neef, 1991, p. 15)

The need for trans-disciplinarity accompanied the progressive emergence of a holistic view of complex global challenges and uncertainties over the past four decades, which discipline-based education systems struggled to address:

> A trans-disciplinary approach is needed … to devise options for a future based on the concepts of sustainability, equity, justice and peace. A trans-disciplinary, holistic understanding of the world's problems … is the starting point for developing a new global consciousness to drive changes in behaviour and lifestyles. (Unesco, 2003, p. 1)

Since according to Commoner's first law of ecology, "everything is related to everything else" (1971, p. 29), a return to a holistic, organic and interlinked approach to knowledge and inquiry was necessary for gaining new insights and finding new solutions (Sterling, 2003, p. 40). An integrated, holistic and trans-disciplinary approach to learning can renew aspects of a former paradigm, but on a more balanced and larger scale, with the advantage of greater knowledge and technology to support it, and without superstition or magic to distort perceptions of reality. A combination of rationality with global values to appreciate all life and guide the use of reason, and a systems understanding of interconnectedness applied through practical, ethical action, are needed for a sustainable future, from which all may benefit.

Clarifying terms

The IIS used the terms 'integrated', 'holistic', 'interdisciplinary' and 'trans-disciplinary' interchangeably (Unesco IIS, 2004, pp. 11-20), when referring to the type of education needed to promote systemic thinking, for addressing the multidimensional and interconnected issues that characterised sustainable development. But each had different meanings requiring clarification, along with other related terms such as 'cross-disciplinary' and 'multi-disciplinary'.

The terms 'integrated' and 'holistic' in the IIS referred to the integration of sustainability across educational curricula for developing systems understandings of ESD, and are discussed later in this chapter in relation to cross-curriculum perspectives in education.

The term 'trans-disciplinary' involved the study of overarching principles, values, processes and methods applied to the overlap of multiple disciplines or perspectives, particularly referring to "mega, complex and elusive" problems requiring solutions that were "greater than the sum of its parts (necessitating a paradigm shift)" (Somerville, 2000, p. 126). Trans-disciplinarity was not a

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new subject or discipline, but rather a process "associated with a variety of knowledge fields and approaches" (Somerville, 2000, p. 5), although trans-disciplinary research could lead to the creation of new disciplines.

The terms 'interdisciplinary' and 'cross-disciplinary' referred to the application of knowledge, models, processes, understandings or methods of one discipline to another, involving the use of, and interface between, two or more disciplines and the interaction between them. This sometimes led to the creation of new fields, such as Biogenetics, Astrophysics, Art Therapy and Psychodrama. In education, this may involve diversifying learning methods by for example, using visual media or role play to facilitate understanding, applying mathematical equations to calculating ecological footprints, or using computer technology for artistic creations.

Nicolescu (1996, p. 2) argued that "transdisciplinarity concerns that which is at once between the disciplines, across the different disciplines, and beyond all discipline", which led him to call for pedagogical innovation to accommodate trans-disciplinary approaches to education, linked to the development of the whole person and the Unesco four pillars of learning (Nicolescu, 1996, pp. 6-10).

Subsequently, Young stated that while there was some overlap between 'trans-disciplinary' and 'interdisciplinary' processes in that they both interfaced with multiple disciplines, 'trans-disciplinary' learning or inquiry involved more than two disciplines, was focused on problem solving and integrated "ethical deliberations" (Young in Somerville, 2000, pp. 127). Trans-disciplinarity therefore went between, across, and beyond different disciplines, surpassing or transcending them, as the prefix 'trans' suggested, going beyond inter-disciplinarity, "to develop both a new vision and a new experience of learning" (Unesco, 2003, p. 1).

A multi-disciplinary approach both to education and research involved using the knowledge and understandings of more than one subject or discipline to make analogies and comparisons, draw conclusions, or reach deeper understandings in order to enhance the one learning area but not to integrate understanding across subjects. Multi-disciplinary approaches to learning helped in the development of comparative and contrasting skills, and provided exposure to diverse perspectives thereby deepening understanding of differences across cultures and disciplines. Furthermore, Hicks (2000, p. xv) extended these views by stating that a curriculum that "prepares learners for solving problems in the twenty-first century must … (provide) exposure to global issues and events from many different perspectives."

However, the specialised knowledge of individual disciplinary approaches to learning remained important because in-depth knowledge supported the capacity to understand other subjects. Somerville saw disciplines as the "essential structural underpinning" of trans-disciplinarity, which in turn contributed to and enriched disciplinary activities by placing them in specific contexts, leading to more integrated and holistic understandings (Somerville, 2000, p. 9).

Where multi-disciplinary and inter-disciplinary inquiry focused on the contribution of disciplines to inquiry, trans-disciplinarity focused on the issue itself (e.g. environmental degradation, hunger, human rights violations, inter-cultural conflict), which supported systems understandings of sustainability issues across various dimensions (HENT, 2005). Manderson claimed that trans-disciplinarity was about change and innovation "finding workable solutions to specific and chronic societal problems" (Somerville, 2000, p. xiii), while using the methods, insights and different perspectives of multiple disciplines (Somerville, 2000, p. 5).

While multi-disciplinary, inter-disciplinary and cross-disciplinary approaches all overflowed disciplinary boundaries, trans-disciplinary approaches to learning sought to unify and integrate

knowledge across learning areas, building bridges between disciplines and meanings (Nicolescu, 1996, p. 4), redrawing existing disciplinary boundaries, and creating a "new epistemology" for a higher level of understanding (Somerville, 2000, p. 5). Nicolescu saw trans-disciplinarity as having a synergistic effect, involving more than adding or blending together information from multiple disciplines, that included the "space" between them and the underlying causes of problems, leading to new insights, perspectives and innovative solutions (Somerville, 2000, p. xv).

Notwithstanding the contribution of trans-disciplinarity to innovative problem solving, all four approaches are necessary and complementary for education, as each has a different function and impact on learners, and work best when applied together in education. References to trans-disciplinarity hereafter refer to the combination of all four approaches discussed above.

Trans-disciplinary approaches to ESD

As early as 1972, Faure highlighted the need for "organic inter-disciplinary links" to be made in education, particularly across scientific and technological disciplines, "to bring about new correlations between parallel branches of learning" (Faure, 1972, pp. 130). The International Implementation scheme (IIS) emphasised the multidimensional and interconnected complexity of socio-political, cultural, environmental and economic issues, necessitating an integrated approach to ESD (Unesco IIS, 2004, p. 12) that was "interdisciplinary and holistic … embedded in the whole curriculum, not as a separate subject" (Unesco IIS, 2004, p. 4), to address current and future problems.

> Sustainable development must be integrated into other disciplines and cannot, because of its scope, be taught as a discreet subject. (Unesco IIS, 2004, p. 16)

Since ESD needed to balance human and economic well-being with cultural traditions and respect for natural resources, education needed to be reoriented to sustainability by reviewing existing curricula and developing "transdisciplinary understandings of social, economic, environmental and cultural sustainability" (Unesco IIS, 2004, p. 20).

A trans-disciplinary approach to ESD entails more than the integration of relevant knowledge and content across disciplines, it also involves: (a) the development of cognitive and functional skills, such as creativity, critical and systems thinking and problem solving applied to all learning areas; (b) exposure to diverse perspectives across all learning areas; (c) fostering the creation of new knowledge and a search for innovative solutions to complex, multidimensional, local and global problems; and (d) the development of certain values and qualities such as sharing, inclusion, cooperation, trust, justice, fairness and democratic participation, requiring transformation to fundamental learning processes.

The IIS promoted a set of underlying values, processes and behaviours that characterised trans-disciplinary learning, including peace and human rights as "over-arching concepts" necessary for development, which in turn needed to take account of environmental impacts (Unesco IIS, 2004, p. 10). But values alone could not transform lifestyles for sustainability, underlying assumptions and systems of thinking needed to be challenged and transcended to what Beare called "higher levels of awareness" that went beyond linear, analytical, "either-or" thinking (Beare, 1993, p. 62). Dialectical processes, which sought solutions that went beyond opposing views to shared principles, in which the East had for long excelled, were well suited for application to trans-disciplinary learning and inquiry. Cognitive skills were needed to accompany values, in order to conduct analyses across subjects, to critique and synthesise information, and to solve problems systemically, taking account of multiple interconnecting factors. Both integrated knowledge (i.e.

trans-disciplinarity), and integrative processes of synthesis, combined with systems thinking for understanding interconnected cause and effect relationships, were needed to solve the complex social, environmental and economic problems borne of an increasingly interdependent world.

A "systemic consciousness" assisted in grasping the consequences of causally related events and actions that had long-term impacts on the environment and human life (Visser, 1999, p. 4). Beare (1993, p. 52) emphasised that a systems view was needed to view local issues from a global perspective, in order to address the "interconnectedness and systemicity that characterise the global system."

Sterling (2003) developed an integrative and holistic model for whole systems thinking, termed 'ecosystemic thinking', which brought together: (a) ecological thought with systems thinking; (b) society with the economy and the environment; and (c) the present with the future, to counterbalance habitual, fragmentary thinking (Sterling, 2003, p. 38). He saw systems thinking as being relational, in identifying links and connections betweens parts by shifting attention from parts to wholes, requiring a fundamental change to the structure and processes of the dominant educational paradigm (Sterling, 2003, pp. 40-47).

There is considerable research needed to develop suitable pedagogy and curricula to facilitate holistic, integrated and trans-disciplinary approaches to learning, in order to meet the goals of ESD. This is particularly needed at the middle and upper secondary levels of schooling, in tertiary education and for the pre-service and in-service education of teachers and educational administrators.

Cross-curriculum perspectives

Cross-curriculum approaches or perspectives in education also refer to the integration of skills, knowledge, values and attitudes across subjects or learning areas in the curriculum, when a concept or theme is considered sufficiently important and of relevance to all learning areas. The IIS considered ESD to be of such importance, calling for it to be interdisciplinary, holistic and "embedded" in the whole curriculum (Unesco IIS, 2004, p. 4). This meant that the skills, values and understandings of ESD were to be integrated across all curriculum learning areas, particularly to facilitate 'learning to live together'.

An example of a cross-curriculum perspective was found in the South Australian Curriculum Standards and Accountability Framework (SACSA), in which 'equity' cross-curriculum perspectives relating to disadvantaged and equity groups of learners, were woven across learning areas to develop recognition and understanding of the socially constructed nature and causes of inequality (SACSA, 2001). However, equity issues were addressed in a piecemeal fashion, focusing on the learning areas through which the issues were woven, with limited opportunity for developing deep understanding of the nature of equity itself. Another example is the identification of 'sustainability' as a cross-curriculum priority in the Australian National Curriculum, discussed in later chapters.

A trans-disciplinary approach to equity within sustainability addresses it systemically from the perspective of the issue or problem itself, in all its dimensions, rather than from the learning area, thereby enabling deep understanding of its multiple facets and causes, and picking up the gaps or "spaces" between subjects or disciplines in the process. Trans-disciplinary learning involves crossing the boundaries of learning areas to deepen and broaden understanding, highlighting the interconnectedness between knowledge, actions and their implications at local

and global levels, potentially providing opportunities for real-life problem solving in learning to live together in a global setting.

In addition to curriculum integration, interdisciplinary and trans-disciplinary studies can be developed in age-appropriate ways for schooling, in the form of regular sessions devoted to 'integrative studies'. Teachers can use current local and global issues of interest to learners, as a basis for reflection and discussion leading to deeper, holistic understandings, as well as the capacity to perceive links and patterns, make connections and conceive of innovative solutions. Trans-disciplinarity lends itself well to scenario-building and problem-based learning, combined with critical thinking, to question existing assumptions and practices, and systems thinking, to view a specific problem within its whole context in seeking appropriate solutions. Futures studies and the application of forecasting and panel discussions such as hypotheticals for example, are also useful for ESD to analyse the range of potential consequences of different courses of action.

Evaluative criteria for values-based Education for Sustainable Development
Owing to the multidimensional nature of ESD, teaching strategies needed to be varied to meet the requirements for an education of quality that was values-based, integrated, interdisciplinary, and transformative, and that enabled learners to think critically and systemically, and to solve complex problems creatively. Democratic processes, values and sustainable practices needed to be modelled in all aspects of school life, including participatory decision making to enable student input to the learning design, "recognising that sustainable development is as much modelled as taught" (Unesco IIS, 2004, p. 20). ESD also needed to be locally relevant, addressing both local and global issues for practical applicability, integrating learning experiences into the life of the learner (Unesco IIS, 2004, p. 5).

These and other characteristics of ESD (specified in the IIS and listed in Appendix 2), are introduced in Chapter 2 and examined and expanded upon in subsequent chapters based on relevant international and Australian documents relating to quality approaches to values education and ESD. The various features of ESD discussed throughout this investigation are synthesised here to form a relatively concise set of evaluative criteria, providing a useful checklist for use by educators and curriculum developers when designing and evaluating school-based curricula and ESD initiatives, as well as for the pre-service and in-service education of teachers and educational administrators.

In addition to the IIS, some of the significant documents from which the evaluative criteria for ESD are drawn are the World Programme for Human Rights Education (WPHRE), since the IIS considered human rights to be an "over-arching concept" for ESD (Unesco IIS, 2004, p. 10), and the Australian Values Education Good Practice Schools Project (VEGPSP), since the IIS saw ESD as being "fundamentally about values" (Unesco IIS, 2004, p. 4). The WPHRE identified similar characteristics to those for ESD, emphasising a positive, student-centred learning environment, discussed in Chapter 7 and summarised in Appendix 25 alongside other relevant international quality education frameworks. The VEGPSP also shared similar features, in particular a whole school approach to values education, discussed in Chapter 5 and summarised in Appendix 12 alongside other relevant Australian documents.

In 2005, Unesco's situational analysis of ESD in the Asia Pacific region concluded that a paradigm shift was needed to implement ESD in schools where more traditional approaches to education were being used, a summary of which is presented in Appendix 36 (Unesco Bangkok, 2005b, p. 60). The features of this shift emphasised lifelong learning that was locally specific

and globally relevant, including learner participation and empowerment, sensitivity to diversity, and the development of critical thinking and problem solving skills.

In Australia, the *National Environmental Education Statement for Australian Schools* advocated a wide range of learning strategies for interactive and experiential student-centred learning that included: (a) values clarification and analysis, (b) creative thinking, (c) future problem solving, and (d) inquiry-based learning (DEH, 2005, pp. 20-21). The complete list of features described in this document are summarised in Appendix 37. The Australian Government's 2009 *National Action Plan for Education for Sustainability*, identified seven principles relevant to ESD that characterised Education for Sustainability (EfS) (Commonwealth of Australia, 2009a, p. 9), which are listed in Appendix 38.

The teaching and learning strategies proposed in the documents discussed above, represent for many educations systems, a significant change from traditional approaches to education. Since many of these characteristics are common to quality education, they may already have been implemented by some Australian education systems at various levels, as part of earlier educational reforms. The transitions required to move from traditional to contemporary, quality, values-based educational approaches appropriate for ESD, are summarised in Appendix 39.

There are considerable similarities among the strategies proposed in the documents discussed above, which share the characteristics of ESD described in the IIS. In the interest of comprehensiveness, the key quality features appropriate for values-based ESD listed in Appendixes 2, 12, 25, and 36 to 39, drawn from Australian, Asia Pacific and international documents, are synthesised in Appendix 40 and grouped into 14 categories for easy reference. This summary of quality ESD characteristics from key documents may be used as a concise set

of criteria for integrating and evaluating ESD in school curricula and school-based initiatives. They are referred to again in Chapter13, when discussing the extent to which ESD is integrated in the Australian National Curriculum.

Conclusion

This chapter identifies, from key international and Australian documents, the knowledge, skills and characteristics needed for a quality approach to ESD, which when combined with the global values discussed in Chapter 6, can inform the development and evaluation of curricula for a sustainable future. It also highlights the importance of trans-disciplinary approaches to the teaching of knowledge, based on an integrated curriculum structure, to enable systems thinking and holistic problem solving, which are integral to Education for Sustainable Development (ESD).

The knowledge needed for ESD, identified in this chapter from key international and Australian documents, is summarised in Appendix 32 to inform curriculum content, which is used as the basis for analysing the content in the Australian National Curriculum, discussed in Chapter 11. Chapters 11 and 13 discuss the extent to which an integrated and systemic approach to the teaching of knowledge is adopted in the Australian National Curriculum, to address the multidimensional nature of ESD.

The skills needed for ESD, also identified in this chapter from key international and Australian documents, are summarised in Appendix 35 to inform curriculum development, which is used as the basis for analysing the skills in the Australian National Curriculum, discussed in Chapter 10. The quality characteristics of ESD, also identified in this chapter from key international and Australian documents, are summarised in Appendix 40 in the form of evaluative criteria for ESD

both to inform and evaluate curriculum development. These are also used in Chapter 13 as the basis for analysing the extent to which ESD characteristics are reflected in the Australian National Curriculum.

The knowledge, skills, global values and characteristics needed for a quality approach to ESD, are therefore synthesised in four key Appendixes, which may be used as checklists by educators and curriculum developers to inform the development of curricula oriented towards ESD. These Appendixes present the following ESD values sets, listings and criteria.

Appendix 18 Global value sets appearing most frequently in International documents related to sustainable development (Also listed in Table 6.1 in Chapter 6).

Appendix 32 Combined list of sustainability issues to inform ESD curriculum content.

Appendix 35 Combined list of sustainability skills to inform ESD curriculum development.

Appendix 40 Evaluative Criteria for values-based Education for Sustainable Development.

These Appendixes are referred to in the following chapters, when analysing the extent to which the emerging Australian National Curriculum succeeds in integrating sustainability and meeting the objectives for ESD.

CHAPTER 9:   INTRODUCING THE AUSTRALIAN NATIONAL CURRICULUM

Introduction

The purpose of this chapter is to introduce the structure and key elements of the developing Australian National Curriculum as background to the analysis in subsequent chapters of the extent to which the curriculum includes the knowledge, values, skills, and key characteristics of Education for Sustainable Development (ESD), summarised in Appendixes 18, 32, 35 and 40. The text analysis in this and subsequent chapters is based upon an examination of the key curriculum documents for each of the four learning areas available at the time of writing in 2011 (ACARA, 2010b, c, d, and e), and version two of the curriculum-shaping document (ACARA, 2010a). The methods used to conduct the curriculum analysis are described in Chapter 3 and mentioned again for each curriculum element discussed.

The journey towards the Australian National Curriculum, hereafter referred to as 'the curriculum', took more than 40 years to initiate, with the establishment of an Interim National Curriculum Board (NCB) chaired by McGaw in 2008. During the intervening decades, considerable progress had been made by Australian States and Territories in refining their individual curricula, each influenced by the other's good practice and international developments, moving towards unification by, for example: (a) establishing the first statement of National Goals for Schooling in 1989, which was revised in 1999 and again in 2008; (b) mapping curricula for eight subjects or learning areas; (c) developing National Curriculum Statements and Profiles in the 1990s for each learning area; and (d) the subsequent National Statements of Learning for many learning areas.

By 2008 it was generally accepted that Australia should have one curriculum for schooling, rather than the existing eight different arrangements, for reasons of consistency, economies of scale and reduced duplication of effort, time and resources (ACARA, 2010a, p. 6). The National Curriculum Board was committed to widespread consultation in developing a "world-class curriculum" based on the best of existing Australian curricula, benchmarked against high-performing countries (NCB, 2008).

In 2009 the Australian Curriculum Assessment and Reporting Authority (ACARA) was charged with the task of developing the curriculum and achievement standards from the Foundation Year to Year 12, in three phases for the following learning areas.

Phase One   English, Mathematics, Science and History, from 2008 to 2011.

Phase Two   Geography, Languages and the Arts, from 2010 to 2012.

Phase Three Health and Physical Education, Information and Communication Technology, Design and Technology, Economics, Business, and Civics and Citizenship, from 2010 to 2013 (ACARA, 2010a, p. 4).

The curricula for English, History, Science and Mathematics from the Foundation Year to Year 10 had been released for implementation in December 2010, although additional enhancements were made during 2011. A trial of these was conducted for three months in 147 schools across all sectors and stages of schooling in 2010. Even though at the time of writing in 2011 only Phase One had been completed, sufficient work had been undertaken to enable an assessment of the curriculum against the values, knowledge, skills, and evaluative criteria for ESD in these four learning areas. Since sustainability is identified as a cross-curriculum priority (ACARA, 2010a, p. 20), it is assumed that the pattern for embedding sustainability across all learning areas is

reflected in the first four. It is hoped that the outcomes of this study are useful to curriculum writers in the development of the remaining learning areas.

Educational goals in the Australian National Curriculum

The development of the curriculum was to be guided by the 2008 Melbourne Declaration on Educational Goals for Young Australians (MCEECDYA, 2008), which was cited selectively in the curriculum-shaping document.

The rationale and goals advanced in the curriculum were very brief, allowing instead the Melbourne Declaration to speak for it, by quoting the declaration in the key curriculum-shaping document, without arguing how these were reflected in the curriculum (ACARA, 2010a, pp. 7-8). Hence, the curriculum was criticised by peak education bodies for lacking rationale and being "unclear in its aims" (The Australian, October 2010). The rationale appropriately but briefly referred to preparing learners for anticipating and responding to change, and for contributing to the "creation of a more productive, sustainable and just society" (ACARA, 2010a, p. 6), consistent with ESD. However, this was not further elaborated in the rationale, other than appropriate references to the histories and cultures of Australia's Indigenous peoples, the consequences of colonial settlement, and the importance of respecting and promoting Indigenous cultural identity, which related to the social and cultural dimensions of sustainability.

The educational goals expressed in the Melbourne Declaration were cited in full as providing the basis for the curriculum (ACARA, 2010a, pp.7-8). Yet the curriculum-shaping document selectively highlighted the following brief quote from among the educational goals to be achieved:

supporting all young Australians to become successful learners, confident and creative individuals and active and informed citizens … promoting equity and excellence in education. (ACARA, 2010a, p. 9)

A national 'world-class' curriculum that is to direct education for the twenty-first century needs to be more explicit in its vision, purpose and outcomes, and in particular, to state how the curriculum can contribute to the type of society that is developed.

The Melbourne Declaration addressed the development and well-being of the whole child, "intellectual, physical, social, emotional, moral, spiritual and aesthetic" (MCEECDYA, 2008, p. 4), but the curriculum selectively addressed the "intellectual, personal, social and educational" needs of learners, through the 'general capability' of 'personal and social competence' (ACARA, 2010a, p. 5). The 'moral' dimension was to be addressed in the curriculum through the 'ethical behaviour' capability, and the 'physical' dimension through the Health and Physical Education learning area.

Not all aspects of the Melbourne Declaration appear to have been taken up by the curriculum developers, or were included selectively. For example, values were de-emphasised or omitted from the text of the key curriculum-shaping document (ACARA, 2010a, p. 9), when describing the knowledge, skills, understandings, dispositions and capabilities that learners would acquire through the curriculum, despite their explicit and repeated inclusion in the Melbourne Declaration on 12 occasions. Values were however, to be included in the general capability for 'ethical behaviour' across the curriculum.

Structure and elements of the Australian National Curriculum

The curriculum sought to integrate the knowledge, skills and understandings to be taught, and the learning achievement standards expected at each level of schooling. It was intended to be

dynamic and provide a foundation for lifelong learning and participation in the community, while responding to the varying needs and interests of all students. It also aimed to enable learners to operate confidently in a complex, information-rich, globalised world, and to respond to future challenges, thereby creating a "more productive, sustainable and just society" (ACARA, 2010a, p. 6). These aspirational statements appear to meet some of the requirements for ESD, but it is the integration of the key features of ESD within the curriculum, and their skilful implementation that ultimately influence whether the vision of ESD is realised.

Learning areas

The curriculum is being developed for 13 learning areas, but the only complete curriculum documents released at the time of writing are for English, History, Science and Mathematics to Year 10 level, so this curriculum analysis is only based on these four learning areas.

Each learning area was to include:

    (a) a statement of rationale and aims;

    (b) an overview of how the learning area was organised;

    (c) individual year level descriptions;

    (d) content descriptions, including knowledge, understanding and skills;

    (e) content elaborations with illustrative examples;

    (f) achievement standards describing the knowledge, understanding, and skill expected at each level of schooling;

    (g) annotated student work samples illustrating the achievement standard expected at each year level, not yet developed at the time of writing; and

    (h) a glossary of terms.

This curriculum analysis focuses on the knowledge and skills, values and characteristics of ESD contained in the parts of the curriculum documents to be implemented by teachers, described in (c), (d), (e) and (f) above, for each learning area to Year 10 level. The introductory statements for each learning area described in (a) and (b) above, are discounted in this analysis, since it is found that these do not accurately represent what is contained in the curriculum. For example, the 'sustainability' cross-curriculum priority was described in the overview for each learning area as: (a) the capacity of the Earth to maintain life; (b) reducing ecological footprints; (c) supporting quality of life and livability; (d) sustainable patterns of living without compromising the ability of future generations to meet their own needs; and (e) contributing to a sustainable future of environmental integrity, economic viability, and a just society for present and future generations (ACARA, 2010b, c, d, e). References to these are rarely found or are non-existent in the content descriptions and elaborations, except for one reference to environmental 'footprints' in Year 10 Science, one intergenerational reference in Year 10 History, but no references to 'quality of life', 'economic viability', 'just society' or 'environmental integrity'.

The feedback from the 2010 school trials of the curriculum indicated that the content descriptions were too broad, vague and ambiguous, lacking in detail and clarity, and thereby leaving potential for different interpretations. However, the content elaborations were considered effective, clear, unambiguous, relevant, appropriate and helpful. Some weaknesses were highlighted such as: (a) lack of consistency in detail, (b) insufficient detail on the depth of knowledge required, and (c) repetition and mismatches between content descriptions and elaborations. Teachers requested more detail, specific examples of classroom activities, explanations of depth required, links to work samples, and a list of resources (ACARA, 2010f, pp. 12-13).

Years of schooling

The curriculum-shaping document divided the year levels of schooling into bands that reflected the key learning outcomes appropriate for each age grouping, with some flexibility and variations. Learning sequences were being developed progressively for each learning area, building competence through sequencing and scaffolding the capabilities, on a year-by-year basis for English and Mathematics, and mostly by bands of years for Science and History (ACARA, 2010a, pp. 18-21). A comparison of the scope and sequence of content descriptions and achievement standards across the ten year levels for each of the four initial learning areas, reveals evidence of scaffolding for building some capabilities progressively upon earlier learning, particularly in English and Mathematics, but not necessarily relevant to sustainability. No such progression in the development of values is evident across the year levels, nor for some of the higher order cognitive skills necessary for effective ESD.

General capabilities

The curriculum sought to integrate seven general capabilities across content in the learning areas, defined as sets of skills, behaviours and dispositions for the development of "lifelong learners able to operate with confidence in a complex, information-rich, globalised world" (ACARA, 2010a, p. 18). These were: (a) literacy, (b) numeracy, (c) information and communication technology, (d) critical and creative thinking, (e) ethical behaviour, (f) personal and social competence, and (g) intercultural understanding.

All seven general capabilities are relevant to ESD, but the capabilities for innovative problem solving, systems thinking and trans-disciplinary understanding, essential for effective Education for Sustainable Development (ESD), are not included. This is surprising given that the curriculum-shaping document cited as justification for the seven capabilities, the Melbourne

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Declaration on Educational Goals for Young Australians, which saw general capabilities as including "capacity to … innovate, solve problems and engage with new disciplines" (ACARA, 2010a, p. 19). However, the definition of the 'critical and creative thinking' capability does imply consideration of cross-disciplinary problem solving, described in this definition as the use of knowledge "in combination" when seeking new solutions:

> Students develop critical and creative thinking as they learn to generate and evaluate knowledge, ideas and possibilities, and use them in combination when seeking new pathways or solutions. (ACARA, 2010a, p. 19)

Ethical behaviour capability

Although the development of values was not listed among the general capabilities in the curriculum, it was implied in the 'ethical behaviour' capability, bearing in mind the distinctions made between ethics, values, principles, morals and virtues in Chapter 4. Ethical behaviour was defined in the curriculum-shaping document with reference to all five of these concepts, incorporating both understanding and behaviour, as reflected in action for the "common good" of society:

> understanding the role of ethical principles, values and virtues in human life; acting with moral integrity; acting with regard for others; and having a desire and capacity to work for the common good. (ACARA, 2010a, p. 19)

This definition meets the requirement for values in ESD that are to be reflected consistently in actions and behaviours, directed towards the well-being of society. However, the integration of values or 'ethical behaviour' is sporadic across the curriculum learning areas. This is discussed further in Chapter 12. Examples of references to learners acting for the 'common good' are not evident in the curriculum.

Intercultural understanding capability

The 'intercultural understanding' capability was defined in the curriculum-shaping document as:

Students develop intercultural understanding as they learn to understand themselves in relation to others. Students learn to respect and appreciate their own cultures and beliefs and those of others, and to engage with people of diverse cultures in ways that recognise differences and create connections between people. (ACARA, 2010a, p. 20)

This capability addresses the social and cultural dimensions of sustainability in the curriculum, and occasionally the socio-political, and is linked closely with two of the cross-curriculum priorities namely, Aboriginal and Torres Strait Islander (ATSI) histories and cultures, and Asia and Australia's engagement with Asia. The emphasis on understanding self in relation to others, and on the values of 'respect', 'appreciation' and 'recognition' while connecting and engaging with others, indicates an intention to treat this capability at depth, which is appropriate for the social and cultural aspects of ESD. Chapter 12 analyses the extent to which this intention is borne out in practice for these values.

The 'intercultural understanding' capability is evident across the four learning areas, with 82 references, indirect or implied, to diverse cultures generally, including the Australian migrant experience, of which 54 are in English, 13 are in some Australian History topics in Years 6 and 10, seven are in Science, and eight in Mathematics. These references are listed in Appendix 41 and summarised in Table 9.1 later in this chapter.

Personal and social competence capability

The 'personal and social competence' capability provides the only indication that the development of the whole child, excluding the spiritual dimension, is attempted in the curriculum, since it is not readily identifiable in the learning activities. The 'personal and social competence' capability was defined in the curriculum-shaping document as students learning to:

understand and manage themselves, their relationships, lives, work and learning more effectively … to understand and manage their emotions, develop concern and understanding for others, establish positive relationships, make responsible decisions, work effectively in teams and handle challenging situations constructively.
(ACARA, 2010a, p. 20)

The only elements of this definition that are readily evident, relate to learning effectively and working in teams. The latter is built into the design of group learning and sharing activities across the four curriculum learning areas, and is also an essential feature of ESD. There are 30 references to the values of 'collaboration' and 'cooperation' mostly in the Science and English learning areas, and 45 references to the sharing and exchange of thoughts and ideas, which imply cooperation and working together in teams. Even though such sharing may also support the "establishment of positive relationships", there are few explicit opportunities for relationship-building evident in the curriculum.

Cross-curriculum priorities

The curriculum sought to embed three cross-curriculum priorities in each learning area to address: (a) Aboriginal and Torres Strait Islander (ATSI) histories and cultures; (b) Asia and Australia's engagement with Asia; and (c) Sustainability (ACARA, 2010a, p. 20). The first two cross-curriculum priorities, linked to the 'intercultural understanding' general capability and relating to the socio-cultural dimension of ESD, are more prevalent in the learning content and activities than is the 'sustainability' cross-curriculum priority, discussed later.

Aboriginal and Torres Strait Islander (ATSI) histories and cultures

The cross-curriculum priority for Aboriginal and Torres Strait Islander (ATSI) histories and cultures was defined as developing "a deeper understanding and appreciation of Aboriginal and Torres Strait Islander (ATSI) histories and cultures, their significance for Australia and the impact that these have had, and continue to have, on our world" (ACARA, 2010a, p. 20). This

priority is integrated across the four learning areas on 88 occasions, listed in Appendix 42, with 44 references in the History curriculum, 24 in English, 12 in Science, and eight in Mathematics. There are only two historical references to Aboriginal Reconciliation in the History learning area, including National Reconciliation Week.

Asia and Australia's engagement with Asia

The cross-curriculum priority for 'Asia and Australia's engagement with Asia' was defined as:

> knowing about Asia and Australia's engagement with Asia because as they develop a better understanding of the countries and cultures of the Asia region, they will come to appreciate the economic, political and cultural interconnections that Australia has with the region. (ACARA, 2010a, p. 20)

There are 50 examples of this, 22 of which are in the History learning area, with three topics devoted to the history of various Asian civilisations in different periods, 17 examples in English, seven in Mathematics, and four in Science. However, most references relate to knowledge **about** Asian cultures, and fewer to Australia's engagement with Asia, necessarily limited to recent history, many of which deal with Asian migration to Australia. References to this curriculum priority are listed in Appendix 43.

Summary

Table 9.1 presents a summary of the references in the four curriculum areas to diverse cultures for the general capability of intercultural understanding, and the cross-curriculum priorities for Aboriginal and Torres Strait Islander (ATSI) peoples, and Asia and Australia's engagement with Asia, the most prevalent being those relating to ATSI histories and cultures and to diverse cultures generally.

Table 9.1 - Intercultural understanding in the Australian National Curriculum

Learning area → Cross-curriculum Priority ↓	English	History	Science	Mathematics	Totals
ATSI histories and cultures	24	44	12	8	88
(A) Asia and (B) Australia's engagement with Asia	17 (12A, 5B)	22[1] (14A, 8B)	4 (4A, 0B)	7 (3A, 4B)	50 (33A, 17B)
General capability for intercultural understanding					
Other cultures including migrants	54	13[1]	7	8	82
Total references	95	79	23	23	220
Legend: A = Learning about Asia; B = Learning about Australia's engagement with Asia. [1] Whole topics devoted to different cultures or civilisations in History					

From the English, History, Science, and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d and 2010e).

Table 9.1 shows that there are 220 references relating to the social and cultural dimensions of ESD, particularly in History and English, referring mostly to information **about** ATSI, Asian and other cultures and societies, including the migrant experience in Australia, but without a values loading of respect or appreciation. The value of 'respect' appears only three times, and the value of 'appreciation' only 12 times, generally referring to literature and aesthetic qualities rather than to diverse cultures. Although words expressing 'recognition' appear 224 times, only 19 of these refer to the recognition of diverse cultures and languages, 11 of which refer to ATSI cultures.

The links between socio-cultural issues and environmental and economic sustainability are rarely made, such as maintaining linguistic and cultural diversity, heritage, and cultural knowledge for their intrinsic benefit, and for their contribution to society. There are a few isolated references to the economic contributions of migrants to Australian society, and eight references to the environmental practices of ATSI peoples and their connection to the land, examples of which are listed in Appendix 44. There are also some isolated references in History and Science to the sustainable or unsustainable practices of other cultures, listed in Appendix 45. These are addressed in the curriculum as separate topics or learning activities, not connected to each other, nor to other learning areas or sustainability dimensions, other than to environmental issues.

These cross-curriculum priority areas appear to be fragmented and disconnected, without links to sustainability nor connections between learning areas to provide a holistic view of how, for example, ATSI people lived sustainably and in harmony with the land for thousands of years, and what may be learnt from this and applied today. The topic on the 'Polynesian expansion across the Pacific' in Year 9 History, however, does link intercultural understanding with sustainability, by addressing how Polynesian societies used environmental resources unsustainably, to the point of extinction of the moa in New Zealand as a result of over-hunting and habitat decline, and the exploitation of Easter Island's palm trees to the point of total deforestation. Such examples offer the potential for a broader discussion, about the socio-cultural and spiritual practices that led to this, and about balancing development with sustainability to ensure the continuation of resources and of society, applied to modern life. These connections appear to be missing from the curriculum, particularly with reference to Australian examples.

Sustainability cross-curriculum priority

The 'sustainability' cross-curriculum priority was defined in the curriculum-shaping document as developing:

> an appreciation of the need for more sustainable patterns of living, and to build capacities for thinking, valuing and acting necessary to create a more sustainable future.
> (ACARA, 2010a, p. 20)

This definition incorporates knowledge, values and skills for a sustainable future, with the terms "thinking, valuing and acting" and 'creating' a sustainable future, but most of the references in the curriculum relate to thinking and learning **about** sustainability, and very few to valuing, taking action, or creating sustainable lifestyles. Reference was made in the curriculum rationale to creating a "more productive, sustainable and just society" (ACARA, 2010a, p. 6), implying that the economic, social and environmental dimensions of sustainability would be addressed, as did the introductory statements for each learning area:

> Education for sustainability develops the knowledge, skills and values necessary for people to act in ways that contribute to more sustainable patterns of living. It leads to students developing an overall capacity to contribute to a more sustainable future in terms of environmental integrity, economic viability, and a just society for present and future generations. (ACARA, 2010d, p. 11)

Nonetheless, this does not reflect what is found in the curriculum itself, in which sustainability is addressed primarily in environmental terms, and mostly in the Science learning area, without links to other sustainability dimensions.

Summary

Neither the general capabilities, nor the cross-curriculum priorities are integrated equally across the curriculum. Some, for example 'intercultural understandings' and 'ATSI histories and cultures', are integrated in English and in Australian History topics, and to a lesser degree in Science and Mathematics, whereas sustainability is addressed primarily in Science, and then

mostly as environmental issues. The curriculum-shaping document acknowledges these variations:

> The general capabilities are represented across the learning areas to different degrees. Some are best developed within specific learning areas. Others can be developed in any learning area depending on teachers' choices of classroom activities. (ACARA, 2010a, p. 19)

> Each of these priorities is represented in learning areas in ways appropriate to that area. (ACARA, 2010a, p. 20)

Some learning areas appear more suited to integrating certain cross-curriculum themes than others, revealing interesting differences in emphases.

Although understanding of Indigenous and diverse non-English speaking cultures is addressed in the curriculum, understanding of Australia's English colonial heritage, and of the pervasive influence of North American culture on Australia is minimal. While it is important to understand others, it is equally important for Australian society to understand itself better, to strengthen its collective identity, and in so doing deepen understanding of others.

Diverse learners

The curriculum sought to meet the "multiple, diverse and changing needs" of all learners, by flexibly accommodating individual abilities, learning histories, cultural and linguistic backgrounds, socio-economic factors, disabilities, and special education needs (ACARA, 2010a, pp. 14-15). This was to be achieved by providing additional time and support for learners whose first language was other than English. Adjustments to instructional processes were also proposed for learners with special education needs, such as those with physical or intellectual learning difficulties, to enable achievement of educational standards comparable to their peers (ACARA, 2010a, p. 15).

Feedback from the school trials of the curriculum revealed concerns about the inability of the curriculum content descriptions and achievement standards to "cater to a diverse range of students such as multi-aged or composite classes, mixed ability groupings and ESL students" (ACARA, 2010f, p. 16). It is not evident in the curricula for the four learning areas how the needs of diverse learners would be accommodated.

Assessment against Achievement Standards

The curriculum specified the expected achievement standards at each year level to support formative and summative assessment and reporting, defining quality learning in terms of: (a) extent of knowledge, (b) depth of understanding, and (c) sophistication of skills (ACARA, 2010a, p. 21). Only knowledge, understanding and skills are therefore the subject of assessment and reporting in the curriculum, excluding a scale of achievement for values from the achievement standards. Pascoe was of the view that in the Australian setting the "absence of assessment and reporting in these areas (i.e. personal and social attributes, and values) is a failure to fully understand our professional responsibilities as educators" and also "a failure to fully prepare students for life" (Pascoe, 2005).

What is assessed is perceived as being most important, and therefore the focus of teaching and learning. A developmental sequence for the acquisition of values and a coherent approach to scaffolding, are needed for values, as for knowledge and skills, so that desired values are introduced and developed progressively in age-appropriate ways. This would facilitate the development of an internal compass in learners for guiding their decisions and choices, enabling them to reflect independently, and continue building and applying their values throughout life. Examples of the scaffolding of knowledge and cognitive skills across the curriculum are in the progressive definitions for 'problem solving' and 'reasoning' in Mathematics that develop with

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each increasing year level, listed in Appendix 46. But such thoroughness is not applied

consistently to all knowledge and skills, nor across all learning areas, and not at all to values.

A full analysis of the values in the curriculum is discussed in Chapter 12.

The achievement standards are also limited in their assessment of the general capability for

'personal and social competence', particularly in the areas of understanding and managing

themselves, their relationships, their lives and their emotions, and developing concern and

understanding for others (ACARA, 2010a, p. 20). These standards do however, systematically

assess the ability to communicate effectively, express viewpoints, feelings and opinions, while

working in teams and sharing ideas with others.

The feedback from the school trials showed that a majority of teachers were generally satisfied

with the achievement standards, some considering them to be clear, unambiguous, coherent,

sequenced and pitched appropriately, and "a unifying feature of the curriculum", but not

allowing sufficiently for different abilities (ACARA, 2010f, pp. 14-15). Nonetheless, there were

other concerns that the standards were: (a) not sequential, with gaps from year to year, thereby

not providing a developmental sequence of learning; (b) too brief, general, broad, vague,

subjective, unclear, and hard to follow; (c) poorly aligned with the content descriptions; (d)

pitched at too high a level across year levels and learning areas (although some thought it was

too low); and (e) lacking in detail, requiring quality descriptors to support teacher judgement of

standards (ACARA, 2010f, pp. 15-16). There was particular concern expressed about the content

descriptions and assessment standards providing insufficient clarity about the depth of teaching

and learning required, and although the provision of annotated work samples would assist, there

was a general call for the development of a detailed scope and sequence (ACARA, 2010f, p. 27).

In designing curricula, there are tensions between the need for both content breadth and depth. Harris-Hart argued that demand for greater depth in education, led to the proposed reintroduction of History and Geography as separate learning areas in the curriculum, and the abandonment of the integrated Studies of Society and Environment (SOSE) learning area, which unfortunately, had been labelled unceremoniously as the "social slops" and "grab bag of disparate disciplines" (Harris-Hart, 2009, pp. 5-6). Concerns were expressed that earlier attempts to develop an interdisciplinary approach to socio-political, cultural and environmental issues through SOSE, would be lost in the return to separate subject disciplines distinctly, notwithstanding cross-curriculum priorities (Harris-Hart, 2009, p. 6); a regressive move from an ESD perspective.

The challenge is to strike a balance in an overcrowded curriculum, between achieving sufficient **depth** of knowledge and understanding, and the **breadth** of understanding needed to link and apply knowledge, skills and values to systems. Learners need to understand how bodies of knowledge intersect in the context of rapidly expanding new knowledge, which is difficult in a rigid discipline-based curriculum.

Definition of Quality in the Australian National Curriculum

Quality of learning was defined in the curriculum in terms of outcomes and achievement standards, as the "extent of knowledge, depth of understanding and sophistication of skills described through achievement standards", measured by quality assurance processes of monitoring, review, evaluation and validation (ACARA, 2010a pp. 16-26).

This contrasts sharply with the summary in Appendix 40 of quality characteristics of values-based ESD, as stipulated in the IIS and other Australian and international documents. These

dimensions of quality were left to the professional judgement of teachers, and to State and Territory school authorities when implementing the curriculum (ACARA, 2010a, p. 25).

Conclusion

The development of the first Australian National Curriculum represents a significant milestone in Australian schooling. The proposal to integrate innovative practices from existing State and Territory curriculum frameworks makes sense given the many examples of good practice and innovation in Australian schools for curriculum developers to draw upon. Among these are the various general capabilities and cross-curriculum priorities, particularly the Victorian practice of including sustainability among these. However, the good practices for implementing values, EfS and global education in Australian schools for example, discussed in Chapter 5, do not appear to have been adopted, given the omission of values from the assessment standards.

The curriculum appears thorough in some areas, such as the scaffolding of learning for selected skills, but is not consistently comprehensive across learning areas or skill groups. The rhetoric in the curriculum-shaping document and in the introduction to each learning area, does not appear to be implemented in the curriculum itself. Aspects of the Melbourne Declaration are adopted selectively in the curriculum, in particular values are de-emphasised in the curriculum-shaping document (ACARA, 2010a, p. 9). Subsequent chapters provide additional examples of these and other issues relevant to the skills, knowledge, and values needed for ESD, beginning with a consideration of skills. The next chapter investigates the skills expressed in the first four learning areas developed for the Australian National Curriculum with a particular focus on the skills applicable to ESD.

CHAPTER 10:   SKILLS IN THE AUSTRALIAN NATIONAL CURRICULUM

Introduction

A text analysis is conducted of the skill references in the first four learning areas of the curriculum, to compare against the skills for Education for Sustainable development (ESD) listed in Appendix 35. The skills are easy to identify because of their frequency (i.e. over 8,000 references), and because they are contained in the verbs, expressed mostly in the gerund form, in the content descriptions, elaborations and achievement standards for each learning area.

The skills expressed in the introductory descriptions and glossary of terms preceding and following the curriculum itself are excluded, since these do not always match what appears in the curriculum. For example, the introductory description of 'sustainability' for the Mathematics learning area referred to mathematical understandings and skills being "necessary to monitor and quantify both the impact of human activity on ecosystems and changes to conditions in the biosphere" (ACARA, 2010d, p. 11). Yet there is no contextualised evidence of this in the curriculum, although the underpinning skills necessary for learners to quantify impacts are included, such as measurement, data collection, analysis, representation, and mathematical modelling.

There are 241 separate terms used to describe skills in the curriculum, and 8,038 individual references to those terms. These are collated and grouped into categories of similar meaning, and placed in order of frequency in Appendix 47, while the full collation of skills in the curriculum is presented in Appendix 48. Comparisons are made in this analysis between these and ESD skills in the IIS and in the Melbourne Declaration, upon which the curriculum is to be based, and in other relevant Australian and international documents, and are recorded in Appendix 35.

Skills in the Australian National Curriculum

The most frequent skill groupings in the curriculum are, in order of frequency: (a) 'thinking' (3,635 references), although the term 'thinking' itself is rarely used in the curriculum descriptions; (b) 'communicating' (2,512 references); (c) 'inquiring' (1,145 references); and (d) 'calculating' (746 references) involving numeracy skills found mostly in Mathematics. There is a large gap in frequency between the first three groups and the other skills, with some overlap between 'thinking' and 'inquiring' and also between 'thinking' and 'communicating'. The skills are both cognitive and functional, although there are fewer instances of the latter, despite the importance of action for ESD.

Thinking

The largest group of skills with 3,635 references, is the 'thinking' group of skills, which includes 'identifying', 'understanding' or 'comprehending' and 'creating' among the most frequent in the group. These are listed in order of frequency in Appendix 47. The 'creating' skills, relate mostly to the creation of various digital and non-digital texts and representations, representing cognitive rather than functional skills, although there are 35 references to 'drawing' and 'sketching'. There are only six actual references to the term 'creative' in the curriculum, all of which are in the English learning area, and just 11 references to 'innovating' or 'inventing', only one of which is in Year 10 Science:

> The values and needs of contemporary society can influence the focus of scientific research … considering innovative energy transfer devices. (ACARA, 2010b, p. 48)

The other references to 'innovating' are found in: (a) English, six of which relate to authors and texts; and in (b) Years 8 and 9 History, relating to innovative Viking keel and sail design, and the spread of technology during the Industrial Revolution, indicating the importance of innovation in times of change. The infrequency of 'innovating' in the curriculum is of concern given the call

for the development of "creative, innovative and resourceful" learners in the Melbourne Declaration (MCEECDYA, 2008, p. 8), and the importance of scientific innovation for finding solutions to complex problems associated with sustainability.

There are 224 references to 'recognising', used in the sense of 'noting' or 'acknowledging', of which only 19 refer to the recognition or acknowledgement of cultural or linguistic diversity, without necessarily expressing appreciation. Since the term 'recognising' does not infer the development of a specific skill other than 'to note', it is not accorded significance in the curriculum analysis despite its high frequency, and is incorporated within the 'thinking' group of skills. Although the recognition of Indigenous peoples and diverse cultures and languages is relevant to social sustainability, references with this meaning in the curriculum number only 11. These are listed in Appendix 49.

Although all of these cognitive or 'thinking' skills are applicable to ESD, the ones contained in the IIS were: (a) critical and creative thinking; (b) problem solving; (c) planning and decision making; (d) futures-oriented thinking; and (e) understandings that are holistic, multidimensional (i.e. socio-political, cultural, environmental and economic), and interdisciplinary (Unesco IIS, 2004, p. 16), to which are added 'holistic', 'linked up' and 'systems thinking'.

The Melbourne Declaration called for schooling to: (a) "enable advanced learning and an ability to create new ideas and translate them into practical applications"; (b) "open up new ways of thinking", including to be "creative", "innovative" and develop capabilities for "flexible", "analytical", and "logical" thinking; (c) develop "deep knowledge within a discipline" while also fostering "inter-disciplinary approaches to innovation and complex problem solving"; and (d) develop the skills to "make rational and informed decisions" (MCEECDYA, 2008, pp. 9-13).

The majority of the skill references in the curriculum do not relate to a significantly high order of thinking, when compared to the requirements of the Melbourne Declaration and the IIS, except for: (a) eight examples of 'synthesising'; (b) 53 examples of 'reasoning', most of which appear in Mathematics, but only 27 examples of 'reflecting', mostly in English; (c) 129 examples of 'problem solving', listed in Appendix 50, 108 of which relate to mathematical problems; (d) 126 examples of 'analysing', only nine of which contain a critical aspect; and (e) only four examples of 'hypothetical' and 'deductive thinking'. There are no examples of 'systems thinking', only references to some systems.

The definitions for 'reasoning' in the Mathematics curriculum listed in Appendix 46, demonstrate the careful approach to scaffolding for each year level, building on previous knowledge and skills. For example, in comparing the definition for 'reasoning' in the Foundation Year and that for Year 10, the former involves simple 'explanation' but the latter requires 'formulating', 'interpreting' and 'evaluating'. However, none of these in Mathematics include the "meta-cognitive" skill of 'reflecting', which involves reasoning and "thinking about thinking" (Gibbons, 2004, p. 129), although there are 21 references to 'reflection' in English and six in Science. The term 'thinking' itself is used only 20 times in the curriculum, of which there are some examples in Appendix 51.

Communicating

The second largest group of skills with 2,512 references, is the 'communicating' and literacy group of skills, which are listed in order of frequency in Appendix 47, comprising an expected range of written, oral, presentation, and technological communication skills. The most frequent are: (a) 'describing' with 311 references; (b) 'using Information Communication Technology (ICT)' with 229 references, which are listed in Appendix 52; (c) 'explaining' with 161 instances;

and (d) 'discussing' with 141. The curriculum provides over 1200 opportunities for learners to interact, discuss, share and exchange ideas, ask and answer questions, comment, clarify and express their thoughts, which is not surprising since literacy is among the general capabilities. In the 'communicating' skills group there are also 110 references to skills associated with 'arguing', 'debating', 'defending' or 'negotiating' a position, 'justifying' or 'substantiating' claims, 'persuading' or 'influencing' others, and 'promoting' a point of view. These are important skills to have when advocating action for climate change or human rights, for example, but these skills are almost never applied in this way in the curriculum.

Despite the frequency of these references, there should be greater emphasis on the critical questioning of current practice, since there are only three examples of 'challenging' and three of 'critiquing' in the 'think' group of skills. There are however, several examples of questioning claims made in the media, and 141 examples of 'evaluating', 'appraising', 'judging' and 'assessing' information. Given the strong emphasis on asserting opinions, there are comparatively few references to 'listening' (i.e. 86), balanced to a degree by the strong focus on 'comparing', 'contrasting' and 'understanding' diverse perspectives.

Inquiring

The third largest group of skills with 1145 references, is the 'inquiring' group of skills, among which the most frequent are 'investigating', 'exploring', 'researching', 'observing' and 'experimenting', presented in order of frequency in Appendix 47. The most frequent incidence of 'experimenting' is found in English with 33 references, and in Mathematics with 19 references, and surprisingly only 16 in Science. These references are listed in Appendix 55. There are no opportunities evident for conducting interdisciplinary research, notwithstanding the references in the curriculum-shaping document to "cross-disciplinary learning" (ACARA,

2010a, p. 17), and in the Melbourne Declaration, to drawing "upon a range of learning areas and disciplines" to enable complex problem-solving (MCEECDYA, 2008, p. 8).

There are considerable overlaps between 'inquiring' and 'thinking' skills, such as' reasoning', 'analysing', 'interpreting', 'concluding' and 'deducing', to name a few. There are also many overlaps with the next largest skills group of 'calculating', since 'inquiring' may involve 'collecting', 'verifying', 'plotting' and 'analysing' research data.

Calculating

The fourth largest group of skills with 746 references, is the 'calculating' or numeracy group, found predominantly in the Mathematics learning area, and listed in order of frequency in Appendix 47. Among these, 299 relate to sorting, grouping, organising, ordering, categorising, or sequencing numbers or objects, and pattern recognition, relevant also to other learning areas and to 'thinking' and 'inquiry'. Numeracy skills support research and inquiry, and the development of models, graphs and charts, from which conclusions or inferences may be made to inform problem solving associated with social, environmental and economic sustainability. The measurement of ecological footprints and carbon emissions for example, are integral to environmental sustainability, but opportunities to develop, practise and apply these skills to sustainability issues are not evident. There are some isolated exceptions relating to human and animal populations, health, wealth and education statistics, weather and tidal patterns, and calculating areas for land use for example, but explicit connections to 'sustainability' are not made.

Summary

Overall, the skills are heavily oriented towards cognitive processes more than to practical or functional skills and applications. There are approximately 1050 references to practical or action-oriented functional skills in the curriculum, representing about 13 per cent of all skill references. The development of action-oriented skills is very important to the success of ESD:

> Learning to take action that will result in people living more sustainably is the central learning goal of the framework, as the acquisition of knowledge and skill has little meaning if it does not lead to effective action. (Commonwealth of Australia, 2010, p. 9)

The successful adoption of sustainable, values-based lifestyles and work practices requires opportunities for applying knowledge and practising new behaviours until they become habitual. Although there are 74 references to 'applying' knowledge, this is relatively infrequent when compared to over 8000 skill references overall. Mere awareness does not alone lead to changes in behaviour, as evidenced by continuing increases in carbon emissions in the face of irrefutable evidence of climate change and its consequences.

The Melbourne Declaration stated that the curriculum would develop learner ability "to work for the common good, in particular sustaining and improving natural and social environments" and "to create new ideas and translate them into practical applications" (MCEECDYA, 2008, p. 8-13). Little evidence of these types of learning activities is found in the curriculum. The introductory statements to the English curriculum stated that "English provides students with the skills required to … advocate action to improve sustainability" (ACARA, 2010e, p. 13), but only three examples of this are found in English:

> Explaining how the features of a text advocating community action, for example action on a local area preservation issue, are used to meet the purpose of the text.
> (Year 5 English - ACARA, 2010e, p. 45)

> Creating informative texts for two different audiences, such as a visiting academic and a Year 3 class, that explore an aspect of biodiversity.

> (Year 6 English - ACARA, 2010e, p. 50)
>
> Presenting arguments that advance opinions, justify positions, and make judgments in order to persuade others about issues such as the importance of maintaining balance in the biosphere. (Year 9 English - ACARA, 2010e, p. 66)

The IIS emphasised the importance of "participatory learning and action" (Unesco IIS, 2004, p. 25), and the need for 'commitment' to implementation, translating knowledge and skills into action for societal benefit (Unesco IIS, 2004, pp. 4-5), the latter requiring values to motivate action, but there is no evidence of such commitment and action for societal benefit in the curriculum.

Skills in the Australian National Curriculum relevant to sustainability

The IIS specified particular skills relevant to ESD, such as skills for peace and managing conflict, for responding to disasters appropriately, and for long-term planning and futures-oriented thinking, stating that 'lifelong learning' and 'life skills' were needed for ESD, including "skills for creative and critical thinking, oral and written communication, collaboration and cooperation, conflict management, decision-making, problem-solving and planning, using appropriate ICT, and practical citizenship" (Unesco IIS, 2004, p. 20). These ESD specific skills are discussed here in relation to their presence in the curriculum.

Peace and conflict management

There are 20 references to information about conflicts that occurred in various parts of the world across time, and seven references to peace addressed in the History learning area (e.g. International Day of Peace, peace treaties, United Nations (UN) peace keeping efforts), but none of these involve the development of conflict management skills.

Disaster management

There are only three references to disaster management in Year 6 Science as follows:

> exploring ways that scientific understanding can assist in natural disaster management to minimise both long and short-term effects. (ACARA, 2010b, p. 31)
>
> researching the scientific work involved in global disaster alerts and communication, such as cyclone, earthquake and tsunami alerts. (ACARA, 2010b, p. 32)
>
> recognising that Science can inform choices about where people live and how they manage natural disasters. (ACARA, 2010b, p. 32)

Skills in disaster management are important, but even more so for disaster mitigation and preparedness, which are not addressed in the curriculum.

Life skills

The instances of 'life skills' are not readily evident in the curriculum, which the *The Dakar Framework for Action for Education For All* defined as the *"capacities to work, to participate fully in their society, to take control of their own lives and to continue learning"*, those for "self-esteem, good health, and personal safety", and for "coping with such problems as the HIV/AIDS pandemic, children with special needs … conflicts and the abuse of drugs" (Unesco Dakar, 2000, pp. 16-28). It is assumed that life skills form part of the curriculum general capability of "personal and social competence", discussed later in relation to whole person development.

Creative thinking

The skill of 'creative thinking' is not specified in the curricular content descriptions, and the term 'creative' only appears six times in English, and there are only 11 references to 'innovating' and 'inventing', but the creation of texts and representations appears frequently across the curriculum. This low frequency of creativity is of concern given that 'critical and creative thinking' are among the general capabilities specified in the curriculum-shaping document, and

that creativity and innovation are important for finding alternative solutions to sustainability issues.

Critical thinking

Although the skill of 'critical thinking' was listed among the curriculum general capabilities, it appears only nine times in the curriculum. Six references relate to a critical understanding and critiquing of texts in Years 7 to 10 English, two involve the critical analysis of the validity of information and approaches used to solve problems in Science, and one from Year 6 Mathematics involves critiquing data-based claims in the media (ACARA, 2010b, 2010d, 2010e). No critical analysis is applied to sustainability issues. Since critical thinking, according to Habermas (1990), also involves logic and moral reasoning against an agreed set of ethics or values, the limited presence of critical thinking also has implications for the application of values in the curriculum.

Cooperation

The skills of 'cooperating' and 'collaborating' appear 30 times in the curriculum, of which only two relate to 'cooperation'. Although 'collaboration' and 'teamwork' appear in the Melbourne Declaration, it may be preferable for the global value of 'cooperation' to be used, because of the unfortunate meaning of 'collaborating' traitorously with the enemy in some contexts. For the most part, the term 'collaborating' is used correctly when referring to working jointly on literary or scientific projects. There are also numerous examples of class sharing, exchange, participation and group activities that are not labelled 'cooperation', that nonetheless, provide opportunities for learners to work together cooperatively in learning activities.

Decision making

The IIS emphasised the importance of ethical decision making, taking account of long-term consequences and multidimensional implications of decisions on all dimensions of sustainability (Unesco IIS, 2004). In the curriculum, there are 17 references to the skill of 'decision making' listed in Appendix 53, one of which contains a moral perspective in the English learning area, and ten of which are in the Science learning area, of which only two are relevant to sustainability. The examples from Science relate mostly to the use of Science in decision making, and the five examples in Mathematics refer to the use of data in making decisions.

Problem solving

The skill of 'problem solving' is also important to sustainability, particularly when combined with critical, creative, futures-oriented, systems thinking and ethical decision making. There are 129 references to the 'solving' of problems in the curriculum: (a) seven of which are in English, and only two of those relate to moral problems in decision making; (b) 14 are in Science; and (c) 108 are in Mathematics applied to numerical and mathematical problem solving. The definitions of 'problem solving' in Mathematics, listed in Appendix 46, differ for each year level, as with the definitions for 'reasoning', to enable scaffolding to build upon previous knowledge and skill.

The higher order problem solving skills in the upper primary and secondary years have potential to be applied to sustainability problems, but an explicit sustainability perspective to problem solving is not evident in the curriculum. There is a thematic thread across year levels in Science that addresses the 'use and influence of science' for solving real-world local and global problems to improve human life, one of which relates to the learner's own life:

> discussing in groups possible situations to investigate or identify problems that relate to students' lives. (From Year 6 Science - ACARA, 2010, p. 32)

The full list of references to 'problem solving' is presented in Appendix 50.

Using Information and Communication Technology (ICT)

There are 229 references listed in Appendix 52, to the use of Information and Communication Technology (ICT), identified as a general capability in the curriculum, with most appearing in English (109). However, there is no reference to the sustainability value of using ICT for reducing carbon emissions, paper use and travel, beyond the benefits of having modern and efficient tools for communicating.

Civics and Citizenship

There are nine references to 'citizens' and 'citizenship' in the History learning area, pertaining to citizen rights of certain groups across time in various societies, and in more recent times, to Indigenous peoples. The study of democracy and citizenship is addressed in Year 6 History, but without evidence of practical application by learners. This is disappointing given the excellent work that was done in Australia since the mid-1990s in developing a practical approach to citizenship and democracy in schooling, and the 15 references in the Melbourne Declaration to the development of informed and responsible local and global citizens (MCEECDYA, 2008). There is no evidence of global citizenship in the curriculum, although this may be included when the Civics and Citizenship learning area is developed in 2013.

Futures orientation

Curriculum writers were to include futures and contemporary orientations into the learning areas (ACARA, 2010g, p. 11). The introduction to the Science curriculum mentioned the role of science inquiry in forecasting change and planning actions for sustainable futures (ACARA, 2010b, p. 14). There are however, only ten specific references to the future listed in Appendix

54, among which are two examples relevant to environmental sustainability, one of which relates to intergenerational equity, called for in the International Implementation Scheme for ESD (IIS).

There are 60 instances of 'planning', and 59 of 'predicting' likely future events, outcomes or results, including a Science topic, "Questioning and Predicting" repeated across year levels, indicative of a futures focus in the curriculum. Of particular note, are four examples of hypothetical questioning in Science, utilising "what if" clauses. There are 57 examples of 'modelling', mostly in Mathematics and Science, some of which relate to predictive modelling, while others involve the making of models without a predictive element. These are listed in Appendix 55. There are also three examples of 'speculating' in English, providing some limited evidence of futures-oriented thinking, planning and predicting in the curriculum.

The theme of time, continuity and change is woven throughout the History learning area, providing opportunities to learn from the past, some of which may be applied to aspects of sustainability. Examples are the study of the extinction of the moa in New Zealand, and the deforestation of Easter Island in Year 8 History, but explicit links with current or future issues are not made (ACARA, 2010c, p. 39).

Systems thinking and holistic thinking

A key group of skills central to sustainability relate to holistic and systems thinking, and interdisciplinary understanding. These involve the ability to identify 'patterns', 'trends', 'links', and 'relationships' between elements, and 'connections' within and across systems and fields of knowledge, in order to generate new ideas and the innovation necessary for solving complex, multidimensional sustainability problems.

The Melbourne Declaration called for schooling to develop the ability to "draw upon a range of learning areas and disciplines" to solve problems and to "create new ideas, and translate them into practical applications" (MCEECDYA, 2008, pp. 8-13). The curriculum attempts to achieve this by setting cross- curriculum priorities and general capabilities, but their actual integration across the curriculum is minimal and variable at best. Nonetheless, the incidence of skill-related terms in the curriculum associated with making links and identifying patterns and relationships, is relatively high (511), particularly in Mathematics and Science, although not linked to sustainability issues. These are listed in Appendix 56 and summarised in Table 10.1.

Table 10.1 - Interconnected understandings in the Australian National Curriculum.

Learning area→ Thinking pattern ↓	English	History	Science	Mathematics	Totals
patterns	33 +1[1]	13	35	64	**146**
link/connect	57	5	12	50	**124**
sequences	52	26	1	31	**110**
relationships	4	6	39	37	**86**
trends	0	3	11	31	**45**
Total references	**147**	**53**	**98**	**213**	**511**

[1] One reference to the 'whole' in the English curriculum, indicating a holistic pattern of thinking: "how the story builds meaning to its climax when we understand the whole." (ACARA, 2010e, p. 49)

From the English, History, Science, and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d and 2010e).

Mathematics contains the most references totalling 213, including: (a) 37 references to numerical, statistical, or algebraic 'relationships'; (b) 64 references to 'patterns', whether numerical, statistical, spatial, or algebraic; (c) 50 instances of 'linking' and 'connecting'; (d) 31 references to number 'sequences' and also to 'trends'. English contains 147 references, 57 of which relate to making links and connections, 52 to sequences, and 33 to patterns. Science

contains 98 instances, with: (a) 39 references to relationships between components; (b) 35 examples of observing or identifying patterns; (c) 12 references to making links and connections; (d) 11 references to identifying trends through data; and (e) one reference to DNA sequencing. History contains 53 references, only 13 of which relate to 'patterns' and 'trends', which are important for projecting learning from past trends into the future for planning purposes. Overall, the most frequent references are to identifying patterns (145), followed closely by 'making links and connections' (124) (ACARA, 2010b, 2010c, 2010d and 2010e).

The ability to identify patterns, links, connections and relationships, is particularly relevant to 'systems thinking', needed when developing solutions to complex sustainability problems, while taking account of interdependent relationships. There are few specific references to 'systems thinking' in the curriculum, which is a significant omission from an ESD perspective, although there are 137 references to different **types** of systems, such as 'communication systems', 'spelling systems', 'belief and values' systems, 'solar' system, 'ecosystem', among others. Understanding **about** systems is emphasised rather than engaging in 'systems thinking', and these references are listed in Appendix 57.

Contributing to Sustainability

Another important set of skills involves contributing to sustainability cooperatively in organisations, communities or the workplace. This can entail engaging learners in community activities, such as cleaning up litter, or pulling noxious weeds, fundraising for a worthy cause, or writing to a Member of Parliament advocating support for a community in need, or protection of a species in decline. These types of activities already occur in Australian schools with a global or sustainability focus, yet the curriculum rarely proposes such learning experiences. There are only four instances of 'advocacy', including one in Year 6 History, but without requiring action by the learner for change:

Investigating the stories of individuals or groups who advocated or fought for rights in twentieth-century Australia. (Year 6 History - ACARA, 2010c, p. 26)

There is a theme of 'informing' and 'persuading' in English (ACARA, 2010e, p. 66), with only two examples that involve persuading others to take a course of action, where Year 6 English learners create informative texts for various audiences to explore "an aspect of biodiversity" (ACARA, 2010e, p. 50), and Year 1 Science learners suggest "changes to parks and gardens to better meet the needs of native animals" (ACARA, 2010b, p. 19). Such rare references do not meet the stipulation in the Melbourne Declaration for learners to "work for the common good, in particular sustaining and improving natural and social environments" (MCEECDYA, 2008, p. 9).

Change and Transformation

In total, there are 210 references to 'change' and 49 to 'transformation' in the curriculum, summarised in Appendix 58, but these do not provide learning activities leading to change, or skill development in how to create positive change, instead they offer examples of observing, noting, or learning **about** changes that have occurred. For example, History contains a theme that addresses the study of continuity and change across time, with 81 references, including considerations of cause and effect, and building understanding about how change occurred in the past. This could potentially inform current or future action for change, by for example, linking history of past conflicts with current global conflicts, and past environmental degradation with current environmental issues, and what lessons may be learned and applied today. Such links between the past and the present are not explicitly made, with the exception of some learning activities in Years 1 and 2, in which aspects of the past are explored in the context of the present, but are not relevant to sustainability.

There are 49 examples of language development in English involving changes in texts, of which only 12 require learners to make textual changes, but not relevant to sustainability. There are several references in which texts can be used to explore an aspect of biodiversity, advocate community action, or persuade others about issues, cited earlier.

There are 35 references to 'transformation' and only eight to 'change' in Mathematics, applied to shapes, objects, patterns, and location for example, with only one reference to changes in biodiversity, in Year 10 Mathematics:

> investigating biodiversity changes in Australia since white settlement.
> (Year 10 Mathematics – ACARA, 2010d, p. 46)

The most relevant examples of 'change' are in the Science curriculum, with 121 references relating to, for example, changes to seasons, habitats, materials, events, landscapes, sky, objects, states, temperature, motion, DNA, energy, systems, populations and resources, chemical, physical, biological and atomic changes, changes that result from climate change, and how change affects sustainability of systems, but only six references to 'evolution' and only in Year 10 Science. The introduction to the Science curriculum highlighted "change in systems, its causes and consequences" and the role of science inquiry in forecasting change and planning "actions necessary to shape more sustainable futures" (ACARA, 2010b, p. 14), but there is little evidence of action for change in the curriculum, nor action that learners could take to help mitigate climate change. The study of types of change in Science mostly involve observation and understanding how change processes occur, with limited examples of how change impacts on learners, and how learners can bring about change themselves:

> They explore change in the world around them, including changes that impact on them, such as the weather, and changes they can effect, such as making things move or change shape. (Foundation Year Science – ACARA, 2010b, p. 16)

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Identifying ways that science knowledge is used in the care of the local environment such as animal habitats, and suggesting changes to parks and gardens to better meet the needs of native animals. (Year 1 Science – ACARA, 2010b, p. 19)

Nonetheless, about 15 per cent of the references to 'change' can be linked to an aspect of environmental sustainability, for example changes to: (a) weather patterns, temperature and resources such as water; (b) disease transmission and populations; (c) the environment and systems, in particular how external changes affect ecosystems; and (d) climate, resulting in changes to sea levels, biodiversity, permafrost and sea ice (ACARA, 2010b). Examples of references to change and transformation across the four learning areas are listed in Appendix 58.

Although learners need to know how physical change occurs in the natural world, they also need to know how to transform values, attitudes, behaviours, lifestyles, and work practices, and how to bring about, or contribute to, positive social, environmental and economic change for a sustainable world. Einstein's well-known saying that problems cannot be solved from the same system of thinking that generated them in the first place (Banathy, 1995), means that a new generation of thinkers is needed to bring about the transformation required to avoid perpetuating the unsustainable practices and lifestyles created by current thinking.

There is little evidence in the curriculum of the steps for taking effective action for bringing about change or transformation around sustainability issues, which were described in the 'sustainability action process' presented in the *Sustainability Curriculum Framework: A guide for curriculum developers and policy makers* (Commonwealth of Australia, 2010) discussed earlier. Some of the skills associated with these steps are however, addressed in the curriculum such as, exploring, assessing, investigating, experimenting, developing, identifying, and communicating, but these are not applied to proposing, implementing or taking action for positive change towards sustainability.

Summary of skills in the Australian National Curriculum relevant to ESD

The skills in the curriculum are categorised according to the Unesco four pillars of learning and listed in Appendix 59, and compared to those in Appendix 35, collated from various international and Australian documents.

Although there are some overlaps occurring across pillars, such as 'create' and 'visualise', the cognitive 'learning to know' skills predominate, both in number of individual skills and in quantity of references. The 'learning to know' skills represent over 63 per cent of the total skill references in the curriculum, 'learning to do' about 34 per cent, 'learning to live together' just over two per cent, and 'learning to be' less than one per cent of all skill references. However, most of the 'learning to do' skills relate to 'communicating', using ICT, or creating and modifying texts, rather than taking practical action for sustainability, of which there are only 15 direct references to 'conserving', 'preserving' or 'protecting'. These ratios do not compare favourably to the collation of ESD skills in Appendix 35, which are more balanced, containing 'learning to know' skills approximating 38 per cent of the total skills collated, 'learning to do' about 27 per cent, 'learning to live together' about 13 per cent, and 'learning to be' 23 per cent of all ESD skills collated.

The low frequency of ESD skills in the 'learning to be' pillar in Appendix 59 highlights the inadequacy of the general capability of 'personal and social competence' in the curriculum discussed later. The 'learning to be' skills listed in Appendix 35, on the other hand, include: (a) life skills; (b) self-management and self-efficacy; (c) self empowerment; (d) adaptability to change and uncertainty; (e) valuing and acting with moral autonomy; and (f) consideration of social justice issues, which are not readily evident in the Australian curriculum documents.

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The 'learning to live together' pillar in Appendix 35 contains peace-oriented skills relating to negotiation, conflict resolution, reaching consensus, and advocacy, as well as general psycho-social skills, which are also not evident in the curriculum. The 'learning to do' skills in Appendix 35, emphasise the active and practical application of ESD skills to changing personal lifestyles, participating in, managing or adapting to change, and creating positive societal transformation, not apparent in the Australian curriculum, although the communication skills are comparable.

While the range of cognitive skills in the 'learning to know' pillar is comparable between the two Appendixes, Appendix 35 contains an additional focus on: (a) higher-order and futures-oriented thinking; (b) understanding and managing complexity, uncertainty and risk; (c) integrated knowledge about social, political, environmental and economic systems and interdependence; (d) making the case for change; (e) considering the consequences to sustainability of applying scientific and technological innovations; and (f) trans-disciplinary understandings, not emphasised in the curriculum.

Conclusion

Although the number of skill references in the curriculum is very high (i.e. over 8000), by far the most are cognitive rather than functional skills, and only about one per cent of these make direct and explicit links to aspects of sustainability, despite the allocation of a cross-curriculum priority to sustainability. Notwithstanding the need to allow scope in the curriculum for skills to be applied to local sustainability issues, teachers would also benefit from specific guidance in how to develop practical skills for sustainability in learners. The next chapter investigates the extent to which local and global issues relevant to sustainability, inform content in the Australian National Curriculum, to assess whether the knowledge that learners are to acquire during their schooling is sufficient to meet the goals of ESD.

CHAPTER 11:   KNOWLEDGE IN THE AUSTRALIAN NATIONAL CURRICULUM

Introduction

The International Implementation Scheme for ESD (IIS) stated that the content of curricula was to be "derived from the local context, addressing issues of relevance and urgency" (Unesco IIS, 2004, p. 20). While global sustainability issues can relate to all contexts, local priorities depend on the socio-cultural and geographic environment. A balance therefore needs to be sought between specifying shared national and global issues in the curriculum, while allowing for flexible inclusion and adaptation of locally relevant content. State and Territory jurisdictions have been given the freedom to "offer curriculum beyond that specified in the Australian Curriculum" (ACARA, 2010a, p. 11), to enable integration of local content. In order for the integration of locally relevant ESD topics to occur seamlessly, a flexible and coherent national framework for curriculum content pertaining to sustainability is needed.

Such a framework has been developed, entitled, *Sustainability Curriculum Framework. A guide for curriculum developers and policy makers* (Commonwealth of Australia. 2010), which structured sustainability content in three broad year groupings to "demonstrate a holistic and integrated continuum of education for sustainability across stages of schooling" (Commonwealth of Australia, 2010, p. 8). Although heavily weighted towards environmental sustainability, the framework was designed to assist curriculum developers in aligning relevant local content across learning areas suited to the stages of schooling. Despite this framework, and the assigning of sustainability to a cross-curriculum priority, coherence and progression are not evident in curriculum content relating to sustainability, notwithstanding that there are still a number of key learning areas to be developed.

Ideally, an integrated approach would have all dimensions of sustainability connected to each other, and addressed in the curriculum in a holistic way. Instead, the various dimensions of sustainability appear to have been scattered variably and disconnectedly across the curriculum, and no mention is found in the *Curriculum Development Process* (ACARA, 2010g) of the mapping of sustainability issues across learning areas and year levels.

This chapter analyses and compares the curriculum content relevant to the ESD issues collated in Appendix 32, to identify the extent to which these correlate.

Knowledge in the Australian National Curriculum relevant to sustainability

Among the issues relating to sustainable development in the curriculum, environmental issues predominate, apart from the socio-cultural dimension already discussed in Chapter 9. The environmental content is discussed here in some detail by learning area, and the presence of global perspectives in the curriculum is also discussed briefly. Few examples of economic sustainability are found in the curriculum.

Global perspectives in the Australian National Curriculum

The International Implementation Scheme (IIS) described the characteristics of ESD as "addressing local as well as global issues" (Unesco IIS, 2004, p. 5) to emphasise the interdependence of sustainability issues. However, global perspectives in the curriculum spanning a range of socio-cultural and environmental issues are limited to only 25, seven of which are in English, nine in History, eight in Science, and one in Mathematics referring to a current global development issue of socio-economic justice:

> investigating the relationship between wealth or education and the health of populations from different countries. (Year 7 Mathematics - ACARA 2010, p. 27)

Only three of the Science references, relate to environmental sustainability, all referring to climate change:

> Global systems, including the carbon cycle rely on interactions involving the biosphere, lithosphere, hydrosphere and atmosphere. (Year 10 Science - ACARA, 2010b, p. 47)

> … factors that drive the deep ocean currents, their role in regulating global climate, and their effects on marine life. (Year 10 Science - ACARA, 2010b, p. 47)

> … how change, including that caused by human activity, affects the sustainability of systems at a local and global level. (Year 10 Science - ACARA, 2010b, p. 49)

Global issues do not relate only to environmental aspects of sustainability, nor do global environmental issues relate only to climate change. There are other pressing environmental sustainability issues such as the availability of clean water, food security, dwindling fish stocks, diminishing oil reserves, loss of biodiversity, over population, soil erosion, large scale forestry, overuse of fertilisers and pesticides, the pollution of air and waterways, and the disposal of radioactive waste, to name a few of the areas in which all ecosystems are under pressure (Lincoln, 2006). There are also global socio-political and socio-economic issues such as political and climate refugees, poverty, starvation, civil wars, tribal and religious conflicts, and the Global Financial Crisis (GFC), which need a balanced treatment in the curriculum.

In the curriculum's favour however, is the fact that there are numerous opportunities for learners to understand issues from diverse perspectives, albeit not global, particularly in History with 36 references, and English with 25. According to Hicks (2000), the development of a global perspective is integral to problem solving:

> A curriculum that prepares learners for solving problems in the twenty-first century must address the global dimension … and exposure to global issues and events from many different perspectives. (Hicks, 2000, p. xv)

It is surprising to find that global perspectives are addressed mostly in Years 9 and 10, given that global perspectives have been part of Australian primary schooling for decades. This issue was raised in the teacher feedback to the curriculum school trials, with at least one teacher asking:

> Where is the global focus in the K-7 section? (ACARA, 2010f, p. 112)

Global and development education have been part of Australian schooling for some time, including the fostering of global citizenship, for which examples are not found in the curriculum, despite its inclusion in the Melbourne Declaration:

> Global integration and international mobility have increased rapidly … This heightens the need to nurture … a sense of global citizenship. (MCEEDYA, 2008, p. 4)

The global issues addressed in the curriculum are listed in Appendix 60.

Environmental issues in the Australian National Curriculum

There are 101 references to environmental issues in the curriculum, of which six are in English, seven in Mathematics, 22 in History, including an elective devoted to the history of the Environment Movement since the 1960s, and 66 in Science, listed in Appendix 61. About 43 per cent of the references to the environment are linked to sustainability, while the remaining 57 per cent are examples of 'environmental education' (i.e. learning **about** the environment), to be distinguished from 'education for sustainability' (i.e. learning **how to sustain** the Earth while meeting the needs of present and future generations indefinitely). These figures are summarised in Appendix 72.

Environmental Sustainability in the National Science curriculum

It is not surprising that by far the majority of references associated with environmental sustainability in the curriculum are in Science, since technological innovation across a wide range of scientific areas is needed to find alternative sources of energy, carbon emissions

reduction, methods of waste disposal, and other solutions to environmental problems. The higher incidence of references to environmental sustainability in Science, is consistent with the IIS statements, which argue that "a scientific understanding of sustainability together with an understanding of the values, principles, and lifestyles will lead to the transition to sustainable development" (Unesco IIS, 2004, p. 16). Technology was also highlighted in the IIS as providing the tools for creating change, with the proviso that it not be misapplied, necessitating education in values and ethics.

Of the 66 references to environmental issues found at every year level in the Science curriculum, half relate to sustainability, concentrated particularly between Years 6 to 10. The environmental issues include: (a) the weather, seasonal changes, and natural disasters; (b) caring for flora and fauna; (c) preserving water and resources; (d) waste management and reduction; (e) use of materials including recycling; (f) the effect of pollutants; (g) the interdependence of living things; (h) loss of habitat and biodiversity; (i) impact of human activity and land management practices on habitats, erosion, water and food chains; (j) solar power and other sustainable sources of energy; (k) the contribution of science to sustainable technologies; and (l) carbon pollution and climate change, among others.

Sustainability references in the Science curriculum emphasise human dependence on ecosystems to sustain life in the Earth's biosphere (ACARA, 2010b, p. 14). The impact of human activity on global systems such as the carbon cycle and climate change is addressed in Year 10, including the causes and impacts of the greenhouse effect, affecting climate change, sea levels, biodiversity, and changes to permafrost and sea ice, in turn affecting deep ocean currents and marine life (ACARA, 2010b, p. 47). Climate change receives more comprehensive treatment than most other issues associated with environmental sustainability, indicating a position taken

in the curriculum that climate change is real and is based on scientific evidence, as attested in relevant international and Australian Government reports. This level of treatment of environmental sustainability is paralleled only by the optional topic on the history of the environment movement in History. The references to environmental issues in Science are listed in Appendix 61, and the data summarised in Appendix 72.

The importance of science for environmental sustainability is particularly evident in the "Use and influence of Science" topic in the Science curriculum, examples of which are listed in Appendix 62. However, solutions to sustainability problems do not only emerge from advances in science and technology, they also spring from the attitudes, values, behaviours and lifestyles of individuals in all contexts, and in the ways they use, conserve, or recycle energy and resources in practice. Teachers can build upon the strength of environmental sustainability in the Science curriculum, by providing opportunities for learners to apply scientific understandings to practical action in their own lives, for example, by reducing water and energy consumption at home and at school, or contributing to environmental initiatives in their community. There are only two practical examples of such applications to the lives of learners in the Science curriculum, as follows:

> People use science in their daily lives, including when caring for their environment and living things … (by) … suggesting changes to parks and gardens to better meet the needs of native animals. (Year 1 Science, ACARA, 2010, p. 19)

> (by) … monitoring information about the environment and Earth's resources, such as rainfall, water levels and temperature. (Year 2 Science, ACARA, 2010, p. 22)

The feedback received from teachers during the school curriculum trials, related mostly to the linking up and sequencing of sustainability content, for example: (a) the Year 9 Science topic, 'Interactions between the Earth's spheres' needing to be included in Year 8 as a natural sequence with the topic 'Ecosystems and their Sustainability' (ACARA, 2010f, p. 51); (b) students

needing awareness of their environmental footprint in Year 7 Science, by being "exposed to the results of human activities and … challenged to learn about the causes, effects and possible solutions to these problems" (ACARA, 2010f, p. 59); (c) the sequencing of sustainability topics in Years 4 and 5 Science, since Year 5 "didn't show progression or flow" (ACARA, 2010f, p. 128); (d) not having background knowledge developed in earlier year levels, such as needing an understanding of sustainable energy before considering why it is needed (ACARA, 2010f, p. 47); (e) sustainable energy transformations not making sense as a Year 6 Physics topic, since energy transformations are addressed in Year 7 Science; and (f) needing more content on the topic of sustainability in Science (ACARA, 2010f, p. 129). A number of feedback comments were indicative of the confusion among teachers about where sustainability topics should be addressed in the curriculum. For example, one teacher thought that sustainable energy transformations were "perhaps more suited to geography" than to Science (ACARA, 2010f, p. 122).

Regardless of how many, or which learning areas are used as vehicles for ESD, the required content ideally needs to be mapped in a comprehensive and coherent framework, across learning areas and year levels, and to be scaffolded appropriately based on previous learning, while linking socio-cultural and environmental issues with economic development. Environmental sustainability in the Science curriculum appears as a smattering of mostly disconnected pieces of information, making it difficult for learners to gain an overall understanding of sustainability issues and how they are connected to each other. Since interdependence is central to sustainability, the integration of knowledge relevant to ESD is essential for any serious progress to be made in this area. The only environmental topic addressed in some depth is 'climate change' mostly in Year 10 Science.

Environmental Sustainability in the National History curriculum

There are 22 references to the environment and the natural world in History, with examples at almost every year level from Year 2 onwards, seven of which relate to sustainability. This includes an elective in Year 10 on the history of the environment movement since the 1960s, in which the concepts of 'sustainability', 'rights of nature', 'interdependence', and 'limits to growth' were introduced for the first time. Since these concepts are integral to an understanding of sustainability, it is essential to introduce these earlier. An interview with a group of primary school children conducted by the researcher in 2007 as part of this study at Jervois Primary School in South Australia, which was participating in the Australian Sustainable Schools Initiative (AuSSI), revealed that children from at least Year 5 were able to express the meaning of sustainability in their own words:

> Sustainability means to keep the environment going forever. (Year 5 student)
> It's like on the cereal box 'Sustain', it keeps things going. (Year 4 student)

Although the History curriculum is structured chronologically from Year 7 to Year 10 beginning with the Ancient World to the current day, this does not mean that sustainability concepts need to be introduced according to this chronological sequence. The study of Australia as a nation in Year 6 provides opportunities to introduce sustainability concepts, along with other related concepts that are addressed at this year level, such as 'democracy', 'diversity', 'heritage' and 'immigration', and to link environmental with socio-cultural and political aspects of sustainability (ACARA, 2010, p. 27). The study of the environment movement and the national and international efforts towards sustainability, ought to be mandatory rather than optional, so that learners gain a comprehensive overview of key sustainability issues, upon which to build other related understandings.

The cross-curriculum priority of sustainability was described in the introductory statements to the History curriculum, as providing content to develop "judgment about past social systems and access to and use of the Earth's resources" as well as to "develop an historical perspective on sustainability" so as to gain "an understanding of how the past relates to the present", and to help make decisions about sustainability in shaping a better future, "informed by historical trends and experiences" (ACARA, 2010c, p. 10). There are some opportunities in the History curriculum to learn about past practices relevant to aspects of sustainability, but explicit links to current issues are not made, particularly in the Australian context, for example: (a) the emergence of farming and settled communities; (b) the Industrial Revolution and subsequent population growth; (c) the overuse of natural resources; (d) efforts to curb deforestation in Shogunate Japan; and (e) Genghis Khan's policy of banning the killing of animals in the breeding season (ACARA, 2010c).

During the school trials of the curriculum in 2009, teachers indicated that more coverage was needed in the History content descriptions of sustainability connections, such as those between Indigenous people and sustainable practices (ACARA, 2010f, p. 112). Other feedback related to students needing awareness of their environmental footprint in Year 7 History, by being "exposed to the results of human activities and … challenged to learn about the causes, effects and possible solutions to these problems" (ACARA, 2010f, pp.126-127). The feedback from the school trials indicated a need by teachers for a more comprehensive, coherent and systematic approach to integrating sustainability across the curriculum. The references to environmental issues in the History curriculum are listed in Appendix 61.

Environmental Sustainability in the National English curriculum

Although there are only six references to the environment or the natural world in English, they represent a diverse range of issues and approaches for addressing them and half of these relate to sustainability. One Year 9 example contained an explicit sustainability focus relating to "the importance of maintaining balance in the biosphere" (ACARA, 2010e, p. 66). The issues range across topics such as: (a) Indigenous care for the Earth, (b) protest songs about the environment, (c) community action on preservation, (d) biodiversity, (e) whaling, and (f) balance in the biosphere. The learning approaches range from presenting persuasive arguments, examining media reports, creating informative texts, listening to protest songs, and hearing Indigenous stories, to examining texts that advocated community action. Despite the diverse and creative approaches adopted, the number of examples is minimal for a cross-curriculum priority, especially when compared to the 95 references in English to diverse cultures.

The cross-curriculum priority of sustainability was described in the introductory statements to the English curriculum as providing students with the skills "to investigate and understand issues of environmental and social sustainability; to communicate information about sustainability; and to advocate action to improve sustainability" as well as "influencing behaviours, facilitating interaction and expressing viewpoints through the creation of texts" (ACARA, 2010e, p. 13). Although the skills of investigating, understanding and communicating are well developed in the English curriculum, very few relate to sustainability. In addition, there are only three examples of advocacy, in which learners were required to create texts, or present arguments, to persuade others about sustainability related issues, cited earlier.

The introductory statements to the English curriculum emphasised the role of literature and literacy in developing the student's world view, stating that "action to improve sustainability

needs to be informed by a world view of people, places and communities" (ACARA, 2010e, p. 13). The exposure of learners to diverse points of view, cultural perspectives, and ways of perceiving the world, is covered well in the English curriculum, but without necessarily addressing sustainability issues.

Although there are 95 references to cultural or linguistic issues in English, whether pertaining to Indigenous or Asian cultures, or migrants, not all of these are directly relevant to socio-cultural sustainability. Most simply raise awareness of cultural and linguistic diversity in Australia without any values base or sustainability meanings attached, but there are some examples in which socio-cultural and environmental aspects of sustainability were linked together:

> texts from Aboriginal and Torres Strait Islander traditions, which include perspectives …
> about how we should care for the Earth. (Year 5 English, ACARA, 2010e, p. 44)

The list of references to environmental issues in English is presented in Appendix 61.

Environmental Sustainability in the National Mathematics curriculum

Of the seven references to the environment or the natural world in the Mathematics curriculum listed in Appendix 61, only one is linked to sustainability, despite introductory statements stating that "Mathematics provides the foundation for the exploration of issues of sustainability" (ACARA, 2010d, p. 11). Nonetheless, it was appropriate to claim that Mathematics "equips students with the skills of measurement, mathematical modelling, and data collection, representation and analysis … needed to investigate data, evaluate and communicate findings and to make predictions" (ACARA, 2010d, p. 11). These skills are addressed in the Mathematics curriculum and have potential for application to "monitor and quantify both the impact of human activity on ecosystems and changes to conditions in the biosphere" and to enable "informed

decision making about present and future action" relating to sustainability (ACARA, 2010d, p. 11), but in practice the skills are not applied to sustainability issues.

The introductory statements added that "actions to improve sustainability involve students in processes such as auditing, reading measures and gauges, and interpreting data on invoices and accounts" (ACARA, 2010d, p. 11), but these learning activities are also not evident in the curriculum applied to sustainability. No references are found to the term 'sustainability' or its derivatives, nor to 'climate', 'carbon emissions' or 'pollution', although there is one reference to 'water consumption', and one to 'water storage and evaporation' rates.

The examples in Appendix 61 demonstrate that learning activities in the Mathematics curriculum are generally not linked to sustainability, with the exception of this Year 4 reference:

> Taking no more than half the eggs from a nest to protect future bird populations. (ACARA, 2010d, p. 24)

The exploration of the variety of birdlife or insect diversity in the school playground in Years 2 and 5, is not linked to declining numbers, loss of biological diversity, nor potential action to reverse the situation by increasing habitat, or using alternatives to pesticide. The Year 5 example of measuring change in the type and number of insects in the school yard over time, has the potential to be linked to sustainability, but the explicit link is not made. The Year 10 example of investigating changes in biodiversity in Australia over time since settlement, does not include discussing causes and restorative actions for sustainability. Examples of the exploration of cause and effect relating to sustainability are rarely found, except for this Year 10 reference in Mathematics relating to social sustainability:

> investigating … that predicted outcomes can be accompanied by unpredicted effects, and understanding the causes for this (for example, Chinese one-child policy becoming the 'one-male' policy). (ACARA, 2010d, p. 46)

Despite potential to apply the teaching of statistics to issues of environmental sustainability, the examples are minimal. There are however, two examples of the application of statistics to social sustainability, one of which addresses the "relationship between wealth, education and the health of populations from different countries" in Year 7 Mathematics (ACARA, 2010d, p. 27), and this Year 10 reference:

> Evaluating statistical reports comparing the life expectancy of Aboriginal and Torres Strait Islander people with that of the Australian population as a whole.
> (ACARA, 2010d, p. 46)

Summary of relevant knowledge in the Australian National Curriculum

The content addressed in the curriculum is summarised in Appendix 63 and compared to the ESD content compiled from various international and Australian documents and listed in Appendix 32, in order to identify potential similarities and differences. This comparison is discussed here with respect to key issues across all ESD dimensions.

Human rights

Human rights issues in the curriculum refer only to gender and Indigenous concerns in historical contexts and not as current issues. The rights of minorities, the poor, the disabled and the marginalised are not addressed at all, nor is the global value of 'solidarity', supporting those whose rights are abused.

Peace and human security

Apart from the history of various conflicts around the world, there are only passing references in History to the International Day of Peace, peace treaties, and UN peacekeeping efforts. The only reference to human security involves caring for water supplies and waterways in Science. There

is no mention of peaceful coexistence, conflict resolution, non-violence, or food security, increasingly of concern with climate change.

Health

The curriculum contains issues relating to public health, longevity, standard of living, Indigenous health, and one reference to the link between wealth, education and health. Whereas, Appendix 32 also contains issues of greater significance to other countries such as hunger, malnutrition, malaria and HIV/AIDS, which should nonetheless appear in the Australian curriculum linked to global education. The topic of intergenerational equity should also be included, involving the rights of future generations to enjoy equitable standards of living and health, as those enjoyed by current generations.

Governance

The History curriculum covered the development of democracy, social and political systems and institutions in various countries over time, and the gaining of citizenship by Indigenous people, women, and migrants, but not the need for just and transparent social systems and institutions. Not covered are civics education, and the exercise of active, responsible, participative citizenship, and the ethical use of power in a democracy, although this is likely to be covered when the Civics and Citizenship learning area is developed. Partnerships, cooperation and working together are addressed in Science, as is the safe handling of hazardous materials in scientific investigations. Media literacy is addressed in English, but not the concept of 'eco-media'. Notable exclusions from the curriculum are the areas of community engagement, development, and empowerment, and the participation and dialogue needed for social change.

Cultural and linguistic diversity

This is a strength area in the curriculum, covering such topics as: (a) Indigenous views of nature, land and relationships; (b) different perspectives, world views, cultures, languages, dialects and social systems, particularly in History and English; and, to a lesser extent, (c) issues related to cultural and national identity. However, there are no links made between self-esteem and cultural identity. Emphases on respect for diversity and tolerance are also slight.

Intercultural and interfaith understanding

There is considerable exposure to diverse cultural perspectives in the curriculum for building understanding, but the only references to other faiths are in the study of the religious features of various societies over time in History. There are only two references in History to the Indigenous spiritual relationship with place, and one in English referring to the Indigenous perspective of spiritual beings. The resolution of conflict or difference is not specifically addressed, but references are found to influence and exchanges between cultures in History at various times. In Science, there are references to contributions of cultural knowledge to science, and scientific 'collaboration' between countries.

Cultural heritage, cultural industries and cultural knowledge

The curriculum addresses the conservation of built heritage, and the use of Indigenous knowledge of flora, fauna, fire and water in Science, including the integration of traditional with modern technologies, but not the maintenance of cultural and linguistic diversity, despite the dramatic loss of linguistic diversity and cultural homogenisation owing to globalisation. This demonstrates a failure in the curriculum to connect socio-cultural issues to sustainability.

The economic development to be gained from cultural tourism or from the sale of cultural goods is not addressed in the curriculum, not for cultural exploitation, but for the socio-economic benefit and empowerment of Indigenous minorities as a means of sustaining language and culture (de Cuéllar, 1995).

Natural heritage and resources

In this area, the curriculum compares favourably to ESD issues in Appendix 32, demonstrating an emphasis on environmental and natural heritage issues in the curriculum. Some issues not addressed are: (a) the need to restore fish stocks, (b) interspecies and intergenerational equity, (c) environmental stewardship and citizenship, and (d) the Earth's capacity to continue sustaining a rapidly growing population.

Climate change

The curriculum covers climate change in greater breadth than the issues listed in Appendix 32, particularly exploring the scientific knowledge relating to climate change, including causes and effects, sea level rise, greenhouse effect and the carbon cycle. However, the critical rate of change is not addressed, nor is there a call to action for learners to explore potential solutions, or take action to help mitigate climate change. In addition, by emphasising issues associated with climate change as the major sustainability factor, the curriculum diminishes other aspects of environmental sustainability that are also important, mentioned earlier.

Rural transformation and agriculture

The curriculum addresses the effect of human activity on agriculture and food chains, and the contribution of science to agriculture, land management, plant cloning, and controlling rabbit and cane toad plagues, particularly relevant in Australia. However, other issues are not

addressed, such as food scarcity and security, and the exodus from rural areas to the city for socio-economic reasons.

Sustainable urbanisation

The treatment of this topic in the curriculum is comparable to ESD issues in Appendix 32, but the curriculum contains greater depth in the area of sustainable electricity generation reflecting national concerns for reducing carbon emissions to address climate change.

Disaster management

This topic in the curriculum also compares favourably with ESD issues in Appendix 32, but with an emphasis on disaster management and issuing disaster alerts, rather than on disaster preparedness and mitigation.

Poverty reduction and working life

While the topics in Appendix 32 include issues of socio-economic justice for the elimination of poverty and suffering, and improving quality of life for the most deprived and marginalised, the curriculum does not address these at all, implying that these do not exist. There are some topics in History relating to working life and conditions at various times, but the absence of references to poverty and suffering today denies learners the opportunity to discover how other children live, and to experience compassion on the one hand, and appreciation for their own life on the other.

Corporate responsibility or accountability, and ethical practices

These topics are not addressed in the curriculum, nor are issues around environmentally and socially responsible development, limits to growth, triple bottom line decision making and

accounting, and sustainable work practices. The curriculum does, however, address ethical practices in science and technology, and in scientific research and data collection.

Economic development and market economy

The economic dimension of ESD involves learning about sustaining the economy without adversely affecting the environment, while supporting social justice and cultural diversity. However, such issues are not raised in the curriculum, with a handful of references addressing the role of scientific and technological innovation to national economies rather than to sustainable production. There are 32 references to economic issues in the History curriculum addressing the social, cultural, and economic context or development of societies in certain historical periods, but not specifically linked to sustainability. There are only two examples of economic sustainability in Year 8 Science, referring to the impact of science on modern farming techniques to improve yields and sustainability, and the role of science in developing technology important to the economies of the Asia-Pacific region (ACARA, 2010b, p. 39).

The ESD issues proposed in Appendix 32 include economic organisation, systems, costs, ecologically sustainable and appropriate development, and the integration of environmental concerns in socio-economic policy, among others that are not addressed in the curriculum. Issues related to economic sustainability might be included in the Economics learning area in 2013, but an integrated approach to the sustainability cross-curriculum priority would ideally have them addressed across all learning areas. The references to socio-economic issues in the curriculum are listed in Appendix 64, alongside socio-political and civic references, appearing mostly in the History curriculum.

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Conclusion

The integration of sustainability in the first four learning areas of the curriculum appears as a series of issues disconnected from each other, making it difficult for learners to gain an overall understanding of the interconnected nature of ESD. The various dimensions of sustainability are not all addressed, with emphasis being primarily on socio-cultural and environmental sustainability, albeit mostly without a sustainability component, while socio-economic issues are minimal, as are global perspectives.

Although the range of cultural and environmental issues addressed are broadly comparable to those for ESD listed in Appendix 32 with some omissions, the curriculum emphasises environmental and natural heritage, climate change and electricity generation. The two environmental topics addressed in some depth are in Year 10 History on the history of the environment movement, and on climate change mostly in Year 10 Science. Of all the content issues addressed in the curriculum across all dimensions of sustainability, only about 15 per cent relate directly to sustainability. These data are summarised in Appendix 72.

The curriculum attempts to cover a broad range of knowledge areas related mostly to environmental sustainability, but is fragmented, with seemingly disconnected areas of knowledge, and without an apparent systematic or comprehensive approach to addressing interconnected sustainability issues. Learners need to be able to connect bodies of knowledge and investigate solutions to problems across disciplines in holistic ways that facilitate breadth and depth of understanding, and to apply learning to other areas. The challenge of balancing depth with interconnected understandings across the breadth of the curriculum is a key feature of ESD requiring urgent attention.

As knowledge continues to increase exponentially, creating more pressure on an already overcrowded curriculum, solutions are needed for integrating knowledge acquisition, or subject disciplines will continue to compete for predominance. In a curriculum with distinctly defined learning areas, integrated understandings are difficult to acquire, as these are lost in the gaps between disciplinary boundaries. Since at this time many discoveries occur by applying knowledge or processes from one body of knowledge to another, a rigid subject-oriented curriculum is likely to result in lost opportunities for fostering innovation, so important for achieving sustainability. It is therefore concluded that the Australian National Curriculum may be heading in an inappropriate direction, in the way it organises and presents knowledge.

Having discussed the skills and knowledge in the curriculum, the next chapter investigates the values expressed in the Australian National Curriculum, with a focus on global values and values relating specifically to sustainability.

CHAPTER 12: VALUES IN THE AUSTRALIAN NATIONAL CURRICULUM

Introduction

The introductory statements in the curriculum-shaping document referred repeatedly to the development of "knowledge, understanding and skills" without reference to values (ACARA, 2010a, pp. 6-18). According to Pascoe, in Australian schools the "absence of an explicit values statement is a value position in itself and is untenable from the perspective of a socially aware community" (Pascoe, 2005, p. 2).

The Melbourne Declaration, which was to guide the development of the curriculum, stated that education equips learners with "knowledge, understanding, skills and values", specifying commitment to "national values of democracy, equity and justice, and personal values and attributes such as honesty, resilience, empathy and respect for others". It also referred to values that "establish and maintain healthy, satisfying lives" and acting with "moral and ethical integrity" (MCEECDYA, 2008, pp. 4-9). However, no references to 'commitment' are found in the curriculum, and there are minimal examples of the values expressed in the Declaration. Such inconsistencies between rhetoric and actuality in the curriculum are also evident in other areas discussed earlier. These are of concern because aspirational statements about goals for Australian schooling, are agreed upon by the Education Ministers, based on the results of consultations with educators and the broader community, and ought to be observed by curriculum writers, without imposing individual preferences or philosophical views in regard to these.

In this chapter an analysis is undertaken of the values expressed in the curriculum by collating the incidence of values in the text of the content descriptions, elaborations and achievement

standards of the four curriculum learning areas and comparing them with global values for ESD. The values appearing most frequently in the curriculum are identified, grouped according to similar values, and listed in order of frequency in the left hand column of Appendix 65, alongside equivalent values in the Melbourne Declaration, the National Framework for Values Education in Australian Schools (NFVE), and the global values listed in Appendix 18. The full collation of values in the curriculum is presented in Appendix 66.

Both explicit and implicit meanings of values in the curriculum are included, so that some references are not actually values (e.g. identity, rights, citizenship), but can be linked with associated values. Included are references to the terms 'morals', 'attitudes' and 'ethical' even though these are not values of themselves.

The values implied in the introductory statements that precede the curriculum descriptions and elaborations for each learning area are disregarded in the analysis, since it is found that the statements do not always match what actually appears in the curriculum. For example, the value of 'equity' appears in the introductory statements for each learning area, the values of 'respect' and 'interconnectedness' appear in the introductory statements for Science and Mathematics, and the value of 'confidence' appears in the introductory statements for Science and History, but these do not appear in the respective curriculum content.

Values in the Australian National Curriculum

Other than when quoting the Melbourne Declaration, values were mentioned only twice in the curriculum-shaping document, once when describing the characteristics of learners who typically question established values when transitioning from primary to secondary schooling (ACARA, 2010a, p. 12), and again when qualifying the 'ethical behaviour' general capability (ACARA,

2010a, p. 19). There was no reference to the National Framework for Values Education in Australian Schools (NFVE), in which millions had been invested for values implementation in schools during the preceding six years.

The curriculum did, however, include 'ethical behaviour' among the general capabilities, which was defined as:

> understanding the role of ethical principles, values and virtues in human life; acting with moral integrity; acting with regard for others; and having a desire and capacity to work for the common good. (ACARA, 2010a, p. 19)

Although this definition is comprehensive and applicable to ESD, its actual integration across the learning areas is variable, and implicit rather than explicit, with very few examples of learners having to practice or demonstrate ethical behaviour, or act with moral integrity. There are very few references in the curriculum to working for the "common good", but they relate to the natural world rather than to society, such as these following examples respectively from Years 1 and 2 in Science:

> … science knowledge is used in the care of the local environment such as animal habitats … to better meet the needs of native animals. (ACARA, 2010b, p. 19)

> People use science in their daily lives, including when caring for their environment and living things. (ACARA, 2010b, p. 22)

Understanding difference

The most frequent references to values in the curriculum relate to 'cultural and linguistic difference', although not actually values, with 93 examples drawn from 220 references to other cultures or languages, summarised in Table 9.1 in Chapter 9. The complete collation of phrases from the curriculum containing concepts of 'difference' is presented in Appendix 67. The terms 'difference', 'different', 'differ', 'diverse' or 'diversity', while not actually values, can be associated with valuing cultural, linguistic or ecological diversity, and accepting and

appreciating different perspectives, so important to ESD. Although the terms are not generally used in this sense, they highlight diverse world views, attitudes, view points, values and perspectives to raise awareness or to foster understanding of others rather than acceptance and appreciation. At times the world views of other cultures are compared and contrasted with aspects of the learner's own life, particularly in English and in the "Perspectives and Interpretations" theme in History, at other times different perspectives are explored, unrelated to cultural diversity and without a values loading of 'respect', 'appreciation', or 'tolerance'. Often they lack sufficient depth or detail to support the development of deep understanding, except for some age-appropriate examples in English:

> … building knowledge, understanding and skills in relation to the history, culture, and literary heritage of Aboriginal and Torres Strait Islander peoples.
> (Year 7 English, ACARA, 2010e, p. 53)

> … reflecting on personal understanding of the world and human experience gained from interpreting literature drawn from cultures and times different from the students' own.
> (Year 10 English, ACARA, 2010e, p. 68)

The International Implementation Scheme (IIS) stated that "ESD will be shaped by a range of perspectives from all fields of human development" (Unesco IIS, 2004, p. 5). Exposure to and understanding diverse points of view are important for ESD, since complex problems may be viewed from different perspectives and fields of study beyond the familiar, deepening understandings, and facilitating the search for innovative solutions. Opportunities to compare and contrast world views enable a deeper understanding of the learner's own perspectives and those of others, leading to evaluating, questioning and challenging viewpoints, towards eventually forming a considered values system as an emerging adult.

Fostering awareness of difference was a strength in the curriculum, in keeping with the Melbourne Declaration goal for learners to "relate to and communicate across cultures … understand and acknowledge the value of Indigenous cultures … (and) contribute to, and benefit

from, reconciliation between Indigenous and non-Indigenous Australians" (MCEECDYA, 2008, p. 9). However, reconciliation is not specifically addressed in the curriculum, except for two passing references in History. The inclusion of such important concepts in education should not depend upon the position of a Government of the day.

Although 'understanding' is among the skills with the highest frequency in the curriculum, with 398 references, surprisingly only eight refer directly to linguistic or cultural understanding. Since 'intercultural understanding' is among the cross-curriculum general capabilities, a greater incidence is to be expected, especially in view of the high frequency of cultural references generally.

According to the IIS, a focus on 'understanding' about ourselves, others, the natural and social environment, "serves as a durable basis for building respect" (Unesco IIS, 2004, p. 4), but 'understanding' combined with explicit learning and practice of the value of 'respect' would have more durable impact. There are several acknowledgements in the curriculum of the diverse contributions of other cultures to Science for example, and of Indigenous connections with the land, and there is no doubt that cultural issues receive extensive treatment across the curriculum.

References to specific values in the Australian National Curriculum

The most frequent value sets identified in the curriculum are listed in Appendix 65. Leaving aside the actual terms 'values', 'morals', 'attitudes' and 'ethical', and instances relating to cultural difference, the most frequent value reference in the curriculum is that of **'sharing'** and **'exchange'** of thoughts and ideas in class discussions, with 45 instances. The term 'sharing' here does not refer to the sharing of resources linked to values of 'equity' or 'fairness', but to communicating and fostering cooperation and teamwork in the classroom by sharing and

exchanging thoughts and ideas. The communicative meanings of these values are strengthened by 15 additional references to the global value 'dialogue' and the high number of skill references to 'communicating' (i.e. 97) , indicating that 'sharing and communicating thoughts and ideas' is by far the most frequent values-related reference, and the second most frequent skill after 'thinking' discussed earlier.

The second most frequent values reference is to **'accurate'** and **'correct',** with 44 instances; 'accuracy' being associated with collecting and recording scientific data, and 'correct' with mathematical calculations and use of language, spelling and grammar. The third most frequent values reference is to **'rights'**, but these are almost all (i.e. 33 out of 34) applied to the study of human rights in the History learning area, without necessarily conveying the rights-related values of, for example, equity, equality, fairness, justice, inclusion, non-discrimination, and dignity.

The fourth most frequent value references are to **'collaboration'** with 28 instances, 16 of which are in Science referring to scientific collaboration, and **'cooperation'** with two, involving cooperative project work with classmates.

The fifth most frequent value reference with 25 instances is **'participation'**, which can be associated with civic or democratic participation, however, the term is used only to indicate participation in class discussions or group learning activities, potentially linked to 'cooperation' but not necessarily having an associated values meaning. The absence of any civic meaning associated with 'participation', or with any other value in the curriculum, is surprising considering that the curriculum listed among its aims the development of "active and informed citizens" (ACARA, 2010a, p. 9).

The sixth most frequent value reference is to **'diversity'** with 24 references, distinguished from 'difference' discussed earlier, five of which relate to natural diversity, five specifically to 'biodiversity', and 14 to diverse cultural experiences, but not in the sense of valuing, appreciating or acceptance of diversity, rather in terms of raising awareness of diversity. This is despite the fact that the Melbourne Declaration clearly stated that "schooling contributes to a socially cohesive society that respects and appreciates cultural, social and religious diversity" (MCEECDYA, 2008, p. 7).

The seventh most frequent value reference is to a **'freedom'** values set, including 'liberation' and 'independence'. Again these refer almost exclusively (i.e. 18 out of 19) to the study of groups or nations in History that had gained political freedom, independence or liberation at various times, without necessarily attributing a value meaning to the liberation process. There is however, one explicit reference to the actual value of 'freedom' in Year 9 English:

> exploring and reflecting on representations of values (for example love, freedom, integrity) in literature drawn from cultures and times different from the students' own. (ACARA, 2010e, p. 63)

The next most common values references are, in order of frequency: (a) **'safety'**, associated with conducting scientific experiments safely; (b) **'conserving, protecting and preserving'** natural, cultural or built heritage; (c) **'empathy'**, for characters in texts, or for various perspectives of the past in History; (d) **'care'** and **'concern'** for others, the environment or for wider issues; (e) **'dialogue'**, referring to the dialogue of characters in texts in English; (f) **'independent'**, referring to the development of independent learners, such as reading independently in English, as distinct from political 'freedom'; (g) **'equality'**, **'fairness'** and **'egalitarianism'** mostly in History; (h) **'democracy'**, referring entirely to the study of democracies in History; and (i) **'appreciation'**, with 12 instances, of which six relate to aesthetic appreciation of literary texts in English, and none of which refer to the appreciation of cultural diversity.

The remaining values, with relatively few references, are: (a) **'identity'**, although not a value itself, is mentioned in the Melbourne Declaration in relation to the development of personal identity, which can be extended to strengthening cultural identity; (b) **'quality'**, found only in Science, relating entirely to the quality of research data and results; (c) **'confidence'** in learning, literacy and numeracy, with only seven references, despite its emphasis in the Melbourne Declaration; (d) **'citizenship'**, found solely in History with only six references relating to the history of democracy and citizenship in Australia, pertaining specifically to citizenship for Indigenous peoples, women and migrants, and not to fostering responsible citizenship in learners as called for in the Melbourne Declaration; (e) **'responsibility'**, with only six references, despite the emphasis in the Melbourne Declaration for self-responsibility, accepting responsibility for one's actions, and becoming responsible global and local citizens (MCEECDYA, 2008, p. 9); and (f) **'creative'**, also with only six references, and mentioned in the Melbourne Declaration.

Values from the Melbourne Declaration in the curriculum

The values of **'honesty'** and **'resilience'**, explicitly mentioned in the Melbourne Declaration, do not appear in the curriculum at all, nor do values associated with establishing and maintaining **"healthy, satisfying lives"** (MCEECDYA, 2008, p. 9). However, the following values from the Melbourne Declaration are in the curriculum: **'empathy'** 15 times; **'democracy'** 12 times; **'equality'** seven times; **'respect'** three times; and **'justice'** only once. The very low incidence of the latter three values is of particular concern, especially since they were in the Melbourne Declaration, and are also among the global values. The value of 'respect' was also one of the values in the National Framework for Values Education (NFVE), and was considered by the IIS to be central to ESD.

ESD is fundamentally about values, with respect at the centre: respect for others, including

those of present and future generations, for difference and diversity, for the environment, for the resources of the planet we inhabit. (Unesco IIS, 2004, p. 4)

(learners) develop personal values and attributes such as honesty, resilience, empathy and respect for others … (and) are committed to national values of democracy, equity and justice. (MCEECDYA, 2008, p. 9)

The contexts in which the value of **'respect'** appear in the curriculum are: (a) once to acknowledge the traditional custodians of the land as a mark of respect (ACARA, 2010c, p. 13); (b) once to investigate Indigenous respect for all things (ACARA, 2010c, p. 21); and (c) once in English to indicate that some words or signs indicate respect for some people and creatures (ACARA, 2010e, p. 32).

Values from the National Framework for Values Education (NFVE) in the curriculum

The following values from the NFVE do not appear in the curriculum at all: **'compassion'**; **'doing your best'**; **'trustworthiness'**; **'honesty'**; and **'fair go'**, although **'fairness'** does appear three times. The following values from the NFVE appear rarely in the curriculum: **'care'** (seven times), although **'empathy'** does appear 15 times; **'responsibility'** (six times); **'respect'** (three times); **'inclusion'** (three times); **'tolerance'** (twice); and **'integrity'** (once). The context of the value of **'tolerance'** relates to religious tolerance of the Ottomans towards Christians and Jews in History (ACARA, 2010c, p. 37), and not in relation to contemporary issues, cultures, or faiths. The only value from the NFVE to appear frequently in the curriculum is **'freedom'** (19 times), although mostly in History relating to how various nations achieve 'independence' or 'liberation', with only one instance in English relating to the understanding and valuing of 'freedom' itself.

Global values in the curriculum

The global values that do not appear in the curriculum at all are: **'solidarity'**; **'harmony'**; **'dignity'**; **'unity'**; and **'equity'**, although **'equality'** does appear seven times and **'fairness'**

three times. The global values of **'integrity'**, **'justice'** and **'security'** appear only once, while the following global values appear rarely: **'peace'** (four times), in relation to events in history; **'respect'** (three times); and **'tolerance'** (twice).

The four value sets that are evident in all four columns in Appendix 65 are: (a) **'care'**, **'empathy'**, **'concern'** and **'compassion'**; (b) **'responsibility'**, albeit only six times (c) **'equality'** linked to **'equity'** and **'fairness'**, with only seven references; and (d) awareness of **'diversity'**. The next strongest relationship among the four columns, are the value sets of: (a) **'participation'**, although not in the sense of **'democratic participation'**; (b) **'freedom'**; and (c) **'dialogue'** or **'communication'**.

Surprisingly, there are very few references to **'equality'**; and to **'justice'**, in a country that has always prized **'fairness'** and a **'fair go'** for all. This is particularly puzzling since the Melbourne Declaration called for developing understanding of "national values of democracy, equity and justice" (MCEECDYA, 2008, p. 5). Disappointing also is the lack of value depth in the treatment of these and other value concepts in the curriculum. Although **'democracy'** appears in the curriculum 12 times, it refers solely to the study of democracy in the History learning area, and the related concept of **'citizenship'** appears just six times. These ought at least to be included more frequently in the Civics and Citizenship learning area to be released in 2013.

A tally of global values in the curriculum is summarised in Appendix 68, which highlights their very low incidence. There are only 87 global value references out of a total of 631 references to values in the curriculum, representing less than 14 per cent of the total.

The values that are notable by their infrequency or total absence, are the values of: (a) **'dignity'**, **'solidarity'** and **'unity';** (b) **'peace', 'harmony'**, **'tolerance'**, and **'dialogue'**, in the sense of reaching understanding or agreement, integral to social sustainability; (c) with no examples at all, **'honesty'**, and one example of **'integrity'**, which are important for economic sustainability in the wake of a Global Financial Crisis brought about by corruption, greed and lack of accountability; (d) no examples of engaging learners in democratic or civic **'participation'**; (e) **'justice'**, which characterises a liberal democracy, with only one instance; (f) **'cooperation'** with only two references; (g) **'respect'**, considered central to ESD, with only three instances; and, (h) although there are no references to **'equity'** in the curriculum, the values of **'equality'**, **'fairness'** and **'egalitarianism'** collectively appear 14 times.

It can be argued that the seven value sets with strong relationships across the four columns in Appendix 65 (i.e. care, responsibility, equality, diversity, participation, freedom, dialogue) presuppose **'respect'** as an implicit, underlying value, without which the others cannot be maintained, but **'respect'** appears only three times in the curriculum. Values need to be explicit in education for this underlying foundation of 'respect' for diversity, whether socio-cultural, linguistic or ecological, to be built solidly. Other values relating to 'respect' for diversity are also infrequent in the curriculum, for example, **'inclusion'**, which appears three times, **'tolerance'**, which appears only twice, and **'multiculturalism'**, although not really a value, with only one reference in History, relating to the Australian Government's policy during a particular historical period.

The total omission of the value of **'honesty'** is difficult to understand, let alone explain. Since 'ethical behaviour' is listed in the curriculum-shaping document as a cross-curriculum general capability, it is puzzling to find no examples in the curriculum in which ethical behaviour, such

as honesty or integrity, is either required of learners, or explicitly a focus of the learning. Also puzzling is the low incidence of the value of **'confidence'**, with only seven instances, considering that the curriculum-shaping document listed the development of 'confidence' in learners among its aims (ACARA, 2010a, p. 9).

Values relating specifically to sustainability

There are few references to values related to environmental sustainability in the curriculum totalling 24, despite being a cross-curriculum priority, with 15 collective occurrences of **'conservation'**, **'protection'** and **'preservation'**, some of which relate to protection of cultural and natural heritage, mostly appearing in the Science learning area. There are only five references to **'biodiversity'** across the curriculum, and only three instances in which the term **'diversity'** refers to living things in Science, and one referring to the diversity of biological systems in History. Examples are rarely found in the curriculum of learners contributing to society and to the environment, or working "for the common good", as called for in the Melbourne Declaration (MCEECDYA, 2008, p. 9).

Values relating to economic sustainability are not evident in the curriculum, even though the IIS stated that "ESD must build a balanced awareness of … economic and financial forces and enable learners to take action to increase public accountability and responsible commercial practices" (Unesco IIS, 2004, p. 19). These are more likely to be emphasised in the Economics and Business learning areas when released in 2013.

Two values significant to ESD, but which appear collectively only five times in the curriculum, are **'interdependence'** and **'interconnectedness'**. The instances of these two values are listed in Appendix 69, two of which relate to the sense of interconnectedness of Aboriginal and Torres

Strait Islander (ATSI) peoples, two others to interdependent organs and systems in the body, and only one to ecosystems. The interdependence of human societies, so important to ESD, is not addressed in the curriculum, although there is one reference in Year 10 History to the interrelationship between humans and the natural environment, and several references in Science to the impacts of humans, events, and changes on ecosystems.

Collective references to values-related terms

In addition to the above values, there are 107 collective references in the curriculum to the terms 'values', 'morals', 'ethics' (or ethical), 'attitudes', and 'principles', summarised in Appendix 70, with the full collation of instances appearing in Appendix 71. Although not included in the total, 'beliefs' are also listed in Appendix 70 because they frequently appear alongside 'values' and 'attitudes' in the curriculum without distinguishing their meaning, such as in these examples from Year 10 English:

> identifying appeals to shared cultural knowledge, values and beliefs.
> (ACARA, 2010e, p. 67);
>
> ways socio-cultural values, attitudes and beliefs are presented in texts.
> (ACARA, 2010e, p. 70);
>
> analyse implicit or explicit values, beliefs and assumptions in texts.
> (ACARA, 2010e, p. 70)

In Chapter 4, the importance of distinguishing between values and beliefs is discussed, since beliefs relate to what is **thought** or **believed** to be true, even if not necessarily so. There is no distinction made between these concepts in the curriculum.

The most frequent of these terms is 'values' with 53 instances, followed by 'attitudes' with 25 instances, and only 21 for 'ethical', appearing solely in English and Science. This is surprising given that **'ethical behaviour'** is a general capability to be reflected across the curriculum.

The highest frequency of these terms occurs in English relating to a range of issues associated with texts, followed closely by History, relating to the values, beliefs and attitudes of civilisations across time. The most unexpected outcome is the very low frequency of the terms in Science (i.e. 11), of which only eight refer to 'ethics', involving the ethical conduct of experiments and investigations, and the ethical application of scientific solutions. There are no obvious or explicit references to underpinning scientific or moral 'principles'. From an ESD perspective, the ethical application of scientific and technological discoveries is key to ensuring sustainable solutions, requiring more extensive treatment in school curricula. The references in Mathematics to number, place and currency value are not relevant and therefore not counted in Appendix 70.

Conclusion

It is astonishing to find that references to some values in the curriculum, particularly those from the Melbourne Declaration and the National Framework for Values Education (NFVE), are either infrequent or absent altogether, especially when compared to the high frequency of references to skills in the curriculum. The values references total 631, equating to about seven per cent of the 8,038 skills references. However, many of these are not actually terms for values since in searching for evidence of values in the curriculum, the concept is extended to include terms where an implied values meaning may be interpreted, such as: 'cultural and linguistic difference'; 'identity'; 'citizenship', 'democracy', and 'exchange', among others. If solely the actual and explicit values in the curriculum are to be counted, such as: 'freedom'; 'safety'; 'empathy'; 'care'; 'equality'; 'fairness'; 'cooperation'; 'appreciation'; and 'responsibility' among others, the frequency of reference to values falls far lower. Indeed the references are so infrequent that it is easy to assume that the curriculum writers chose to adhere to the now rejected view that education ought to be values free. The infrequency is more likely because the

achievement standards were framed solely in terms of knowledge, understanding and skills (ACARA, 2010a, p. 21), making these the subject of assessment and reporting, and therefore the subject of teaching and learning as well.

In addition to their infrequency, the meanings of the values are considerably diluted by their context when compared to the meanings of the same terms among global values, as defined in Appendix 20. Several examples must necessarily be raised such as: (a) 'sharing, which refers exclusively to ideas and not resources; (b) 'participation', which does not have a democratic or civic dimension; (c) 'dialogue', which is not used in the sense of solving a problem or disagreement leading to understanding; (d) 'freedom,' which does not explore the many dimensions of what it means to be free, other than liberation from political domination; (e) the breadth and full implications of 'equity', 'equality', 'fairness' and 'justice' in society and globally, which are not investigated; (f) the meanings of 'honesty', 'integrity', 'responsibility' and 'accountability', so important to ESD, which are not addressed at all; (g) the depth of 'respect', 'appreciation', 'tolerance', 'acceptance' and valuing of cultural and natural diversity, so integral to ESD, which are not explored ; (h) the engendering of 'care' and 'concern', or 'stewardship' and 'responsibility' for the natural world, which is minimal at best; and (i) the fostering of 'unity', 'solidarity', 'support' for one another, and 'commitment' to working together for the 'common good' (MCEECDYA, 2008, p. 9), both within and across communities or nations, which are barely evident and so important for countering selfishness.

Distinctions are not made between values-related terms, in particular between values and beliefs, requiring clarity on the part of both teachers and learners for a solid foundation on values to be established. In addition, the nature and spread of the values represented, are incomplete and

inadequate for the task of preparing learners to contribute to the development of a socially, environmentally and economically sustainable society, locally and globally.

With specific reference to the incidence of **global values** in the curriculum, proposed as being essential for ESD, as listed in Appendix 18 and discussed in Chapter 6, less than 14 per cent of the total 631 references to values can be considered to be global values.

It seems that, as with quality, values are left to the professional judgements of teachers, and priorities set by school sites, and State and Territory school authorities when implementing the curriculum (ACARA, 2010a, p. 25). In order for the necessary lifestyle transformations to occur, knowledge, understandings and skills can provide only part of the solution. The development of values towards sustainability is needed to provide the impetus and motivation to bring about change, and by ethically applying the acquired knowledge, understandings and skills for change and innovation towards sustainability to occur responsibly.

Although it is essential for the appropriate values, knowledge and skills to be integrated in school curricula to meet the objectives intended for ESD, the ways in which these are taught and structured within the curriculum, have a significant impact on the effectiveness of ESD. The next chapter investigates the extent to which the evaluative criteria for a quality approach to ESD are met within the Australian National Curriculum.

CHAPTER 13:   EVALUATING THE AUSTRALIAN NATIONAL CURRICULUM AGAINST CRITERIA FOR ESD

Introduction

This chapter analyses the extent to which the Australian National Curriculum meets the quality characteristics and evaluative criteria for values-based Education for Sustainable Development (ESD) (summarised in Appendix 40). Although all the criteria are addressed in this discussion, there is a particular focus on key ESD characteristics, such as: (a) the multidimensionality of ESD, (b) curriculum integration and trans-disciplinarity, (c) developing the whole learner, and (d) engaging the whole school community in sustainability.

Multidimensionality in the Australian National Curriculum

Since sustainable development is multidimensional, with interlinked social, cultural, environmental and economic issues and perspectives, so too must ESD be multidimensional. The social perspective may be further divided into issues that are: (a) socio-cultural, pertaining to the maintenance of diverse cultural practices, spiritual beliefs and languages, and the fostering of mutual respect, tolerance, understanding, and harmony among cultures, religions and language groups; (b) socio-political, for stable governance, democratic participation, citizenship, universal franchise, civil and legal rights, and the ability to participate actively in all aspects of civic life; and (c) socio-economic, for social and economic justice, human rights, and having basic needs met, such as food, clean water, shelter, education, employment, housing, and medical services, to reduce gaps between the wealthy and the impoverished.

The issues in the curriculum are tallied and summarised in Appendix 72 according to learning areas and sustainability dimensions, to demonstrate the absence of a connected or multidimensional approach to sustainability in the curriculum. There are 220 references to

cultural issues, summarised in Table 9.1 that are mostly disconnected from sustainability and the preservation and maintenance of language, natural and cultural heritage, and traditions, although some of these do link Indigenous culture with care for the environment. Of the 101 references to environmental issues in the curriculum, listed in Appendix 61, 44 are linked to sustainability, mostly in the Science learning area.

There are 36 examples of economic issues in the curriculum listed in Appendix 64, many of which refer to the socio-economic features of various societies in History, without a sustainability or development focus, although one example in Year 7 Mathematics addresses the "relationship between wealth, education and the health of populations from different countries" (ACARA, 2010d, p. 27), and another compares the life expectancy of Aboriginal and Torres Strait Islander (ATSI) peoples with the broader Australian population. Only two references in Year 8 Science, link sustainability with economic development, referring to the impact of science on modern farming techniques to improve yields and sustainability, and the role of science in developing technology important to the economies of the Asia-Pacific region (ACARA, 2010b, p. 39).

There are 63 references to social issues listed in Appendix 64, referring mostly to the social and political features of various societies in History, including the study of struggles for freedom, liberation, democracy, and human and civil rights. While the limited references to social justice in the curriculum are disconcerting overall, 20 of the 63 social references presented in Appendix 64 relate to the study of various rights movements in History from Years 6 to 10. These refer mostly to Indigenous and women rights, with a socio-political rather than a socio-economic emphasis. Although there is potential to connect these issues with sustainability, the links are not made in the curriculum.

Of the 420 references to cultural, social, economic and environmental dimensions in the curriculum, summarised in Appendix 72, the most frequent is: (a) cultural with 220 references, of which only 18 are linked to sustainability; (b) environmental 101, of which 44 are linked to sustainability; (c) social 63; and (d) economic 36, of which only four are linked to sustainability. Of the 420 references, 66 are relevant to sustainability, representing less than 16 per cent of the total. However, this is a generous assessment, since a key aspect of ESD involves skill development, either for direct action or at least a call to action, and examples of these fall below one per cent.

Curriculum integration in the Australian National Curriculum

The multidimensional nature of sustainability requires an integrated curriculum that enables trans-disciplinary and systemic understandings of the complex causes of interconnected problems. In this way, learners come to understand the consequences of decisions and courses of action, which can be applied to problem solving and decision making, taking account of multiple interdependencies.

Among the strengths of primary schooling in Australia, has been the integration of knowledge, values and skills, blurring boundaries between traditional subject disciplines, such as in the Studies of Society and Environment (SOSE) learning area, which was abandoned with the development of the national curriculum. Although it has been argued that depth was lost in this integrated approach, it did nonetheless prepare learners with the connected understandings so essential to sustainability.

There were statements in support of cross-disciplinary learning in the Melbourne Declaration (MCECCDYA, 2008, pp. 8-13), in the *Sustainability Curriculum Framework* (Commonwealth

of Australia, 2010, p. 8), and in the 2010 curriculum-shaping document (ACARA, 2010a, p. 27). Despite stated intentions and the allocation of a cross-curriculum priority to sustainability, the curriculum does not appear to succeed in integrating sustainability across the curriculum in the ways that were intended, nor in the ways that the IIS proposed. However, opportunities to develop the skills to enable learners to make those connections themselves are included in the curriculum, by developing skills to identify, relationships, patterns, trends and sequences in over 500 instances, summarised in Table 10.1 in Chapter 10.

Not all dimensions of sustainability are addressed in the curriculum, nor are they connected to each other, and socio-cultural references are not linked to sustainability. The sustainability cross-curriculum priority is not applied uniformly across learning areas and year levels. The content relating to sustainability is not scaffolded coherently in a planned framework. Instead environmental issues, less than half of which relate to sustainability, are scattered disjointedly in some parts of the curriculum.

While some cognitive skills are addressed in a relatively planned way, the same cannot be said of values, nor of content relevant to sustainability, with the possible exception of some cultural references. The introductory statements to each learning area contain a section entitled 'Links to other learning areas', in which the foundation skills developed in one learning area can be applied to another. For example, in the English curriculum, the skills of communicating, comprehending concepts, making connections, interpreting symbols, problem solving, analysing evidence, justifying points of view, drawing conclusions and making presentations, are also relevant to Mathematics, Science and History (ACARA, 2010e, p. 14). But no such statements are made about the links between sustainability content or concepts across learning areas and year levels, nor are there links between values across learning areas and year levels.

Other than the allocation of cross-curriculum priorities and general capabilities in the curriculum, there is little explicit evidence of trans-disciplinary approaches to knowledge and learning. There are 13 examples given in Years 7, 8 and 10 Science of cross-disciplinary cooperation listed in Appendix 73, connecting ideas across diverse scientific fields to foster innovation, only four of which are linked to sustainability:

> considering how water use and management relies on knowledge from different areas of Science, and involves the application of technology. (ACARA, 2010b, p. 35)

> recognising that traditional and Western scientific knowledge can be used in combination to care for Country and Place. (ACARA, 2010b, p. 35)

> recognising the role of knowledge of the environment and ecosystems in a number of occupations. (ACARA, 2010b, p. 40)

> scientific developments in areas such as sustainable transport and low-emissions electrical generation require people working in a range of fields of Science, engineering and technology. (ACARA, 2010b, p. 48)

Although these examples expose learners to the possibilities of cross-disciplinary cooperation, they do not provide opportunities for learners to engage in cross-disciplinary inquiry, reflection, discussion or project activity, to connect their knowledge from various sources in practice.

Pedagogy and teaching methods in the Australian National Curriculum

The curriculum makes no attempt to specify the pedagogical approaches to be used for the teaching and learning of sustainability, or for any other area of learning. It was considered that "schools and teachers determine pedagogical and other delivery considerations" (ACARA, 2010a, p.10).

It was left to teachers to decide how to introduce concepts and learning processes, and how to "progressively deepen understanding" for student learning (ACARA, 2010a, p. 17), using integrated and pedagogical approaches that met student needs and interests in the local context

(ACARA, 2010a, p. 11). It was also assumed that schools would decide how best to organise

student learning appropriate to the context, potentially involving other school-developed

programs and flexible learning pathways that "extend the learning entitlement and ensure all

students are fully engaged" (ACARA, 2010a, p. 13). From this, it is concluded that the

curriculum advocated a student-centred approach to learning.

Developing the whole learner in the Australian National Curriculum

The International Implementation Scheme (IIS) emphasised personal learning as being "the most

likely to foster the values which underpin sustainable development" (Unesco IIS, 2004, p. 15),

by helping individuals to:

> grow and develop intellectually, emotionally, spiritually or practically … developing as a
> whole person … realising their strengths and potential. (Unesco IIS, 2004, p. 15)

The IIS also linked "the development of strong positive values in learners" with socio-emotional,

personal and spiritual learning, as learners find out "about themselves … the world around them

and their place in it", thereby forming a strong identity to underpin the personal and collective

transformations needed for a sustainable society (Unesco IIS, 2004, p. 15). Such personal

learning involves not only knowing, but also being and doing, including a focus on useable life

skills (Unesco IIS, 2004, p. 16) considered to be "at the centre of quality education for all"

(Unesco, 2005c, p. 6). Also conducive to personal learning and values development are positive

relationships with teachers and others, within a safe, supportive and democratic learning

environment.

The Melbourne Declaration echoed similar sentiments by calling for the development of

successful and confident learners with "a sense of self-worth, self-awareness and personal

identity" able to "manage their emotional, mental, spiritual and physical well-being, … develop

personal values and attributes" and "act with moral and ethical integrity" (MCEECDYA, 2008, p. 9). Education was to help learners build social and emotional intelligence, nurture their well-being, enable them to relate well to others and to "understand the spiritual, moral and aesthetic dimensions of life" (MCEECDYA, 2008, p. 13). The propositions involved in shaping the curriculum, are less ambitious and exclude the values component of learner development, simply requiring that:

> children have a strong sense of identity … are connected with, and contribute to, their world … have a strong sense of well-being … are confident and involved learners … effective communicators … (and) become competent members of the community.
> (ACARA, 2010a, p. 9)

The general capability of 'personal and social competence' is defined in the curriculum-shaping document as students learning to:

> understand and manage themselves, their relationships, lives, work and learning more effectively … to understand and manage their emotions, develop concern and understanding for others, establish positive relationships, make responsible decisions, work effectively in teams and handle challenging situations constructively.
> (ACARA, 2010a, p. 20)

The strongest presence of these capabilities in the curriculum, in order of their frequency and prominence are:

(a) becoming 'effective communicators', since 'communicating' iss the second highest group of skills with 2512 references, listed in Appendix 47;

(b) numerous opportunities to find out 'about themselves, the world around them and their place in it', thereby developing 'self awareness' and a 'sense of identity' and of being 'connected with their world';

(c) many opportunities to practise how to 'relate well to others', build 'social intelligence' and become 'involved learners', linked to communicating, which involves 'participating' (25 references), sharing and exchanging ideas (45), and 'contributing' (11) to class discussions, as listed in Appendix 47;

(d) understanding the 'moral dimensions of life', emphasising the skill of 'understanding' (397 references), rather than 'acting' morally, with a total of 107 references to morals, values, ethics, attitudes and principles, summarised in Appendix 70. But learners are not necessarily equipped to 'act with moral and ethical integrity' since opportunities to act upon morals, ethics and values are not evident in the curriculum, and 'personal values and attributes' appear to be excluded (i.e. honesty, resilience, empathy and respect for others), since these are either infrequent or absent from the curriculum altogether;

(e) building 'emotional intelligence', with 58 opportunities in the curriculum to recognise and express feelings and emotions, understand how others feel, and express care and concern for others, the natural world and for various social issues, as listed in Appendix 74; and

(f) understanding the 'aesthetic dimensions of life', with 16 references in English primarily relating to aesthetic appreciation of texts, as listed in Appendix 75.

The following aspects of socio-personal development mentioned in the statements quoted earlier, are either not evident or appear infrequently in the curriculum:

(a) becoming 'active and responsible citizens', and 'members of the community', 'contributing to their world', since only five examples are identified in the curriculum of learners taking action for positive change or making a contribution to society, as are listed in Appendix 76;

(b) understanding the 'spiritual' dimensions of life, with only one reference to Indigenous spirituality in Year 1 English, and two in History. However, there are 23 references in History to various religious festivals and the religious life of societies studied, listed in Appendix 77; and

(c) the development of 'personal values and attributes', such as honesty, resilience, empathy and respect for others, with very low incidence of these in the curriculum, as are shown in Appendix 66 and discussed in Chapter 12.

There is insufficient detail in the curriculum to gauge whether learners are able to develop 'self worth', 'self confidence', and a sense of 'well-being'; or to develop the ability to 'manage their emotional, mental, spiritual and physical well-being'; or to discover a 'love of lifelong learning'; 'realise their strengths and potential'; 'develop useable life skills'; and become 'successful'. These developments occur within the context of a safe, supportive and democratic learning environment, in which there are positive relationships of mutual respect, trust and care with teachers and others. Since these stipulations are not mentioned in the curriculum, it is up to educators in the school context to engender these by creating a positive learning environment.

Despite the many opportunities in the curriculum for learners to communicate, discuss, share and exchange ideas, there are few examples of building positive relationships with the broader community. There are 22 references to 'relationships' in the curriculum listed in Appendix 78, mostly relating to learning **about** various types of relationships, for example, through language or texts in English, by studying relationships within and between societal groups in History, or the representation of Indigenous kinship relationships.

Whole school community approach in the Australian National Curriculum

ESD involves engaging the whole school community in sustainable practices, and integrating sustainability in school planning, policies, practices and programs, thereby reinforcing learning.

Australia's *National Action Plan for Education for Sustainability* (EfS) called for a "whole-of-school and whole-of-system" approach to EfS, focused on "achieving a culture of sustainability … reinforced by continuous improvement in the sustainability of campus management" (Commonwealth of Australia, 2009a, p. 21). The intention was to embed sustainable habits and behaviour patterns in learner lifestyle and eventual work practice.

Despite this, there is no consideration given to whole school activities in the curriculum, whether focused on sustainability or on other areas of learning, even though there are numerous examples of whole school approaches to sustainability among schools engaged in AuSSI Sustainable Schools and Global Education initiatives.

Evaluative criteria for ESD in the Australian National Curriculum

The evaluative criteria for ESD that are synthesised in Appendix 40 and discussed in Chapter 8, may be used for examining the extent to which curricula meet ESD requirements. These evaluative criteria are reproduced in Appendix 79, with summary comments in the right hand column describing the extent to which the Australian National Curriculum addresses them. From this analysis, strengths and areas for potential further development or research are identified.

The curriculum analysis reveals the following strengths when evaluated against the ESD criteria:

- learning activities to explore, compare and contrast diverse perspectives;
- examples of some socio-emotional learning activities, involving communication, interaction, cooperation, aesthetic understanding, and expressing thoughts, opinions and feelings;
- developing awareness and understanding of diverse attitudes and perspectives;
- many opportunities for learners to participate in cooperative group learning, and express opinions;
- many learning activities regarded as personally relevant, and locally contextualised, emphasising issues relevant to the Australian context; and
- a few opportunities to investigate and analyse hypothetical or real-life issues.

However, gaps, omissions and weaknesses in the curriculum, insofar as ESD is concerned, are identified in the following areas:

- values frequency is very low, particularly for global values with no systematic approach to integrating values explicitly across the curriculum;
- values are not assessed, nor is there evidence of a progression or scaffolding for values acquisition;
- no whole school modelling of values or sustainable practices is evident;
- no evidence of whole person learning is evident, with the primary focus being on cognition;
- no evidence of building skills for creating personal or social change, or for assuming civic responsibility for contributing positively to society are evident;
- inadequate practical application of ESD knowledge and functional skills, and few out of class activities are evident;
- not all sustainability dimensions are addressed nor are they interconnected;
- minimal global perspective;
- no opportunities for resolving conflict evident;
- no evidence of systems thinking nor systemic approaches to teaching sustainability;
- no opportunities for inter-disciplinary learning are evident;
- limited opportunities to develop divergent, creative or innovative thinking; and
- few opportunities for long-term futures thinking.

The following ESD characteristics cannot be discerned from the curriculum as they are presumably left to State and Territory education systems, schools and teachers to address, as are appropriate for each context:

- fostering positive learning environments, relationships and self esteem;

- choice of teaching methods;

- learner-centred teaching;

- modelling of values and sustainable practices by teachers and across the whole school; and

- whole school approaches to ESD.

Conclusion

There are considerable strengths in the curriculum, such as opportunities for learners to: (a) participate in group learning and express themselves using a wide range of media; (b) select topics of inquiry of personal and local relevance; and (c) conduct a wide range of investigations providing exposure to diverse perspectives. However, there are many significant gaps and weaknesses that are central to ESD, in particular:

- the very low incidence of values and the failure to develop a developmental progression or assessment for values acquisition;

- the very limited opportunities for action towards sustainability on the part of learners;

- the minimal global perspective;

- the failure to interrelate the multiple dimensions of ESD; and

- the absence of an integrated, systemic and inter-disciplinary approach.

These limitations lead to the conclusion that the curriculum has not succeeded in adequately integrating the cross-curriculum priority for sustainability, nor of meeting the criteria for Education for Sustainable Development (ESD).

Having investigated the values, knowledge, skills and evaluative criteria for ESD, the final chapter summarises the findings of this study, and potential improvements in future curriculum iterations, as well as their implications for teacher education and future research.

CHAPTER 14:   CONCLUSION

This study extracts the collective knowledge and experience of international and Australian educators, expressed in existing normative and policy documents, and synthesises these into four key checklists of the knowledge, skills, values and quality characteristics of Education for Sustainable Development (ESD). The intention is for this study to produce subject matter that is interesting, relevant, informative, and easily applied in practice by educational administrators, policy makers, curriculum developers, teacher educators, educational researchers, school teachers, and student teachers.

The entire study may be grasped and applied by referring to four key Appendixes, namely: (a) the global values in Appendix 18; (b) the ESD issues to inform knowledge in the curriculum, summarised in Appendix 32; (c) the ESD skills in Appendix 35; and (d) the ESD evaluative criteria in Appendix 40. These may be used as checklists when designing and evaluating ESD implementation in educational policy, curricula and programs in schools, but are equally adaptable to vocational and tertiary education, given the broad applicability of ESD principles. Since the aim of this study is to evaluate the Australian National Curriculum against the values, knowledge, skills and criteria for ESD, the following findings refer specifically to this.

Summary of findings regarding the Australian National Curriculum

This study provides an assessment of four curriculum learning areas, which highlights several strengths, such as the identification of 'sustainability' as a cross-curriculum priority for the first time, which represents a major milestone for the integration of ESD in Australian schooling. The identification of 'inter-cultural understanding' as a general capability, and two cross-curriculum

priorities devoted to cultural perspectives are also major advances, even if not linked explicitly

to sustainability, nor linked sufficiently to values of respect, tolerance and cultural appreciation.

This study finds that the curriculum incorporates a wide range of predominantly cognitive skills

relevant to sustainability, listed in Appendix 47. The range of environmental and socio-cultural

content covered in the curriculum, listed in Appendix 63, is substantial, particularly relating to

the environment, although not comprehensive. In addition, there are significant strengths evident

in Appendix 79, particularly emphasising group learning and inquiry, individual expression

using Information and Communication Technology, and addressing personally and locally

relevant issues.

In view of the fact that nine learning areas of the curriculum are yet to be developed, there

remains considerable scope for the curriculum to address the dimensions of sustainability that

are not addressed adequately in the first four learning areas under consideration.

For example, Geography can further address the interaction between society and the

environment, in the ways humans use the landscape, sustainably or otherwise, and how the

landscape shapes human lifestyles, as well as the impact of natural disaster. Economics and

Business can address the socio-economic dimension of sustainability, absent from the first four

learning areas, incorporating concepts of sustainable, responsible and accountable social and

economic development. Health and Physical Education can address, for example, the emergence

of pandemic and the return of tropical diseases because of climate change, risk management, risk

mitigation, and preparedness for natural disasters. Design and Technology can address the

importance of creativity and innovation in addressing sustainability problems, while Civics and

Citizenship can foster responsible national and global citizenship and civic action for positive societal and environmental change, also absent from the first four learning areas.

Despite the strengths and potential for development in other learning areas, there is considerable scope for improvement in the curriculum for ESD to be implemented successfully, particularly in the areas of values, integrated knowledge across all ESD dimensions, whole school learning activities, and action-oriented application of knowledge.

Potential for improvements to the Australian National Curriculum

There are four key areas that need to be addressed in subsequent curriculum developments for the quality features of ESD to be met, as outlined in Appendixes 18, 32, 35, and 40.

First, global values for ESD, including those in the Melbourne Declaration and the National Framework for Values Education, need to be integrated systematically and explicitly across the curriculum, based on a scaffolded framework of values for age-appropriate development at each year level. This involves additional research into practical ways of assessing values, and for values to be incorporated into achievement standards for assessment. The integration of values in the curriculum also contributes significantly to the personal, psycho-social, spiritual and emotional development of the whole learner.

Second, all dimensions of sustainability need to be addressed relatively equally across the curriculum, and not separately from each other, but linked and integrated holistically in ways that reflect the interconnected nature of society, culture and the environment, in both local and global contexts. This facilitates cross-disciplinary investigation and problem solving of complex sustainability issues.

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In order to address this need, cross-disciplinary inquiry may be explored in regular sessions of 'integrative studies', when cross-dimensional topics are analysed in hypothetical or real life scenarios, and innovative solutions are envisioned from systems and futures perspectives. These can involve debates, projects, role plays, or games and virtual scenarios using information technology, in which groups of learners explore diverse perspectives and solutions to sustainability issues, while balancing socio-cultural, environmental and economic factors. Learners may, in this way, link bodies of knowledge and develop inter-disciplinary understandings, at appropriate age levels, for innovative problem solving towards sustainability. Hence, the sustainability cross-curriculum priority may be addressed in a more balanced way across learning areas.

Third, the curriculum needs to provide opportunities for learners to engage in more experiential learning activities, as active and responsible citizens taking practical action for positive societal and environmental change, by initiating or contributing to projects in the local community, or linked to global concerns. Schools participating in the Australian Sustainable Schools Initiative (AuSSI) initiative have been doing this for many years, and offer good practice examples and case studies of learning activities that can easily be integrated into the curriculum (DEWHA, 2010). The five-step 'sustainability action process' in the *Sustainability Curriculum Framework. A guide for curriculum developers and policy makers* (Commonwealth of Australia, 2010, p. 9), which outlined the practical action steps required for learning how to bring about change, that was scaffolded progressively in levels of sophistication from Kindergarten to Year 10, may also be adapted in a revised curriculum.

Fourth, the curriculum needs to include learning activities that support and encourage the modelling of values-based sustainable practices across the whole school, so that learning occurs

within a culture of sustainability, in which the values are common place. As mentioned earlier, AuSSI schools have been implementing whole school Education for Sustainability (EfS) learning activities mapped to State-based curricula for some years, which offer models for such mapping to occur in the national curriculum.

Of the four key areas for future curriculum revisions outlined above, some may be implemented relatively easily with minor changes and enhancements to existing documents, supported by existing proven case studies and resources. There are excellent examples of good practice and precedents among schools participating in the Australian Sustainable Schools Initiative (AuSSI), in Global Education projects and in multicultural, Indigenous and Studies of Asia initiatives to inform the curriculum.

Other necessary curriculum changes are more challenging, requiring additional research, in particular, for the development of integrated, and inter-disciplinary approaches to curriculum development, involving close cooperation among curriculum writers, putting aside concerns about disciplinary boundaries or predominance. Such transformational changes also necessitate strategic and targeted approaches to the preparation of new and existing teachers.

Implications for teacher education

To enable the successful implementation of values-based ESD, appropriate and timely preparation of teachers, curriculum writers and educational administrators is essential, by integrating ESD within existing pre-service and in-service teacher education. There is insufficient time to wait for a new generation of teachers to prepare students for a sustainable future. Since sustainability is a cross-curriculum priority, teacher professional education is

needed for all educators, regardless of their disciplinary expertise, in how to link content to sustainability and across ESD dimensions, and to support learners in making these connections. Unesco considered teacher education institutions to be "key change agents in transforming education and society" (Unesco, 2005a, p. 11), and that educators were vital for "stimulating the learner's interest and appreciation of issues of sustainable development" (Unesco IIS, 2004, p. 29). Yet Sterling found that very few teachers around the world had been exposed to sustainability issues during initial teacher education, and that even where sustainability existed in the curriculum in some form, the majority of teachers had "little idea about how to teach this area, or about its deeper pedagogical and other implications" (Sterling, 2001, p. 70).

Equally in the area of values education, both Halstead (1996) and Lovat (2007) found that little attention had been given to values in teacher education programs. Lovat argued that values "should be made explicit and become the focus of critical inquiry in teacher education", and that preparation in ethics and strategies for teaching and learning about moral and ethical issues should also be included (Lovat, 2007, pp. 45-46).

The issues raised in this study regarding the need for ESD to be: (a) values-based; (b) multidimensional, integrated, and trans-disciplinary; (c) developing the whole learner; (d) transforming and transformative; (e) involving critical and creative thinking, systems and futures thinking, and complex problem solving; and (f) engaging whole school community approaches to sustainability, all have significant implications for teacher education, both pre-service and in-service. Recognising this, Unesco commissioned the publication of the *Guidelines and Recommendations for Reorienting Teacher Education to address Sustainability* (Unesco, 2005a), to support the development of teacher education for ESD in areas such as, curriculum, pedagogy, policy, practice, programs, reward, research, ICT, partnerships, networking and communication.

The recommendations stated that a key challenge was to establish ESD in policy and practices throughout teacher education institutions (Unesco, 2005a, p. 5), requiring "a complete transformation in … teacher training programmes" (Unesco, 2005a, p. 59). This acknowledged that value-based ESD was as much modelled as taught, in the values and sustainable practices reflected in teacher education institutions and in schools. The guidelines also indicated that teacher educators and researchers had a responsibility to "participate as critical colleagues and advocates" for sustainability, by exploring the assumptions and ESD concepts that applied in their field and across faculties. Engaging in processes of critical inquiry and open discourse about the complex inter-relationships and issues among the various dimensions of sustainability, were essential for understanding their implications for teaching and other professions (Unesco, 2005a, p. 8). In addition to the need for teacher education, the Unesco 2008 report, *ESD On the Move*, on the implementation of ESD in the Asia Pacific region found that, "Government officials, school administrators and others in decision-making positions must (also) be provided with ESD training if systems are to be changed to integrate ESD into current policies and plans" (Unesco Bangkok, 2008, p.2).

The International Implementation Scheme (IIS) for ESD considered that "the attitudes and methods which the educator employs must reflect the values of sustainable development, as well as the highest standards of pedagogical practice" (Unesco IIS, 2004, pp. 29). Given the quality imperative, the IIS called for teachers to be "equipped with strategies for integrating it (i.e. ESD) into their classroom practice" (Unesco IIS, 2004, p. 22), in terms of content, skills and values, but also using processes that were holistic and transformative. This requires an understanding of how to integrate ESD with other aspects of learning in the curriculum, using appropriate teaching and learning processes, while ensuring that values underpin learning activities, reflected in classroom practice, and across the whole school. In view of the influence of teacher modelling

on learners, teacher education needs to foster teacher reflection and awareness of the values expressed in their speech and behaviour, for achieving congruence between stated and lived values. In addition, the personal experiences of values formation and expression in teachers, lead to increased understanding of the learning experiences needed to facilitate deep integration of values in their students.

In Australia, the report of the research study conducted by the Australian Research Institute for Environment and Sustainability (ARIES) into *Mainstreaming education for sustainability into pre-service teacher education in Australia* (Ferreira, 2009), addressed ways in which sustainability could effectively be integrated into pre-service teacher education. It recommended: (a) increased capacities in the teacher education community; (b) changes to approaches to teaching and learning; (c) improved networks in the teacher education system; and (d) engagement of relevant stakeholders, including government agencies and non-government organisations, to understand and support the change (Ferreira, 2009).

Although the Unesco guidelines and the ARIES report are useful, the question remains of how to implement them in practice, recognising that ESD must not simply be added to teacher education curricula as a separate subject, but needs to be woven through existing subjects, to enable teachers to integrate the multiple dimensions of sustainability into their teaching.

Existing teachers can benefit from in-service professional education to introduce concepts and processes that are not offered during their initial education, with opportunities for school-wide practical action learning and action research rather than theoretical approaches. Teachers may also develop their understandings of sustainability by sharing with peers in communities of practice, and engaging in reflection, research and inquiry in school-based teams. The broader

school community and parents also need to be engaged as part of a learning community, together discovering practical approaches to sustainability that meet local needs, as part of a whole school approach to sustainability.

Teacher education institutions also need to foster research and innovation in the emerging area of ESD to: (a) understand the interconnected issues that urgently need to be addressed; (b) establish baseline data against which to measure progress; (c) conduct longitudinal studies to analyse the impact of ESD; (d) develop appropriate teaching methods; (e) identify the conceptual and practical links between ESD and other aspects of learning (e.g. literacy, numeracy, sciences, Information Communication Technology); (f) contribute to the development of effective integrated and trans-disciplinary curricula, and associated learning resources; (g) explore the processes of personal and values development; and (h) develop a systemic approach to curriculum change.

But it is not only teachers and teacher educators who can benefit from professional education, since they alone are not able to bring about the levels of systemic change required. Educational executives, policy makers, researchers and curriculum developers, also need to develop understanding of key ESD issues, since they are tasked with designing or approving the educational policies and curricula needed to address current and future challenges. Tertiary educators, business leaders and politicians would also benefit from an understanding of sustainable development more broadly, to grasp the implications for tertiary education programs, business practice and the formulation of State and National social and economic policy.

Implications for further research

Further research is needed in three key areas for the effective implementation of values-based ESD, namely: (a) the teaching of values in school-based education; (b) the assessment of values; and (c) integrated and trans-disciplinary educational approaches for connecting the multiple dimensions of sustainability.

First, in the area of teaching values, there has been much written about **which** values are likely to engender a peaceful, just and sustainable world, but less is known about **how** to foster effectively the age-appropriate development of values without indoctrinating learners, apart from the outcomes of the Values Education Good Practice Schools Project (VEGPSP) case studies in Australia.

The teaching of values needs to take account of the cognitive development of moral reasoning, the affective development of appreciating and valuing towards the internalisation of a worldview, as well as the development of skills that enable values to be implemented confidently. Connected to this is the need for more research and practical case studies, demonstrating how to scaffold the psycho-social and emotional development of learners, including service-learning, and fostering life skills, resilience, and personal qualities.

Related to these areas is the role that spiritual development plays in advancing ethical consciousness and deeply held values, which motivate positive contributions to society and the environment. Research is needed to deepen understanding of the processes of human development, values formation, and personal transformation, which lead to the adoption of sustainable lifestyles, and the ability to make change. Such research involves understanding and applying the dynamic processes of change and transformation at personal and collective levels,

to support learners in their own personal transformations, and to empower them to become agents of societal change for a sustainable future.

These issues raise difficult questions that are not easily answered, such as whether or not there are values that are inherent to human nature, held universally prior to socialisation and enculturation. If this were true, the challenge is how to draw out the very best of human nature without artificially imposing values that are easy to abandon under threat or stress, or when no-one is watching. If this were not true, then the challenge is how to foster the values that are **needed** for a peaceful, just and sustainable world. Further research may provide deeper understanding of these and related issues.

Second, further research is needed into how the development of values may be assessed authentically in schooling, building on the work of Bloom (1971), Smith and Tyler (1942) and others, and drawing on existing Australian initiatives for the assessment of values and attitudes, such as those conducted by the Australian Council for Educational Research (ACER, 2001).

It is shown in Chapter 9 that the assessment of knowledge and skills shapes the achievement standards in the Australian National Curriculum, which in turn influence curriculum content and the design of learning activities. Educators are experienced in, and familiar with, assessment in these areas, but there is limited or no experience with the assessment of values acquisition. Although a rationale was not given for excluding values from the curriculum achievement standards, it is reasonable to assume that the absence of a solid evidence-based approach for the assessment of values development, based on credible research, could explain the apparent reluctance of curriculum designers to address this problem. Hence, the urgent need for research, and testing of credible approaches to the assessment of values acquisition, based on relevant past

and recent studies, and the latest knowledge in the fields of sociology, psychology and neural science.

The third area of research needed is how to integrate all dimensions of sustainability into education holistically, to enable the development of future leaders and decision makers in all fields and professions, including business, commerce, finance and politics, who are well-prepared to take a systemic view of complex problems. These skills enable innovative solutions to be found across bodies of knowledge, viewed from perspectives that are different from those that created the problems in the first place. Increasingly scientific and technological innovations occur at the boundaries and crossing points of disciplines, where knowledge principles from one discipline inform another. Yet education, at both secondary and tertiary levels, remains committed to the study of separate disciplines, with large knowledge gaps occurring in the spaces between them, without the means to connect these bodies of knowledge to each other, nor to identify the similar trends and patterns that exist across many of them; patterns that may offer the advancement of potential solutions to intractable problems.

Little practical guidance is available as to how trans-disciplinary learning may occur in practice in a subject-based education system. Among the evaluative criteria for ESD, 'trans-disciplinarity' presents a key area of complexity, supported by a relatively small and obscure body of knowledge that fails to address issues of practical application, but the difficulty of implementation is matched by the degree of its significance to ESD.

Learning across disciplines requires transforming current educational approaches, including curricula and scheduling, that neither teachers nor education systems are as yet well-equipped to handle. Simple practical solutions are suggested for offering scheduled sessions dedicated to

integrative studies, as a useful interim measure that is relatively easy to implement during a period of transition. The transformational shift required for a trans-disciplinary approach to ESD may need some time for research and trials to be undertaken, curriculum solutions found and implemented, and teachers educated appropriately. Generational change would yield a new cohort of educators, who are themselves exposed to systems and inter-disciplinary learning, to implement confidently trans-disciplinary approaches to ESD.

In the meantime, there is a considerable amount of work already undertaken in Australian schools, in the areas of values education, whole school approaches to EfS, global education and the development of local, national and global citizenship, and many other innovative initiatives that are readily available to inform future curriculum development. With input from the many experienced educators in these areas, the Australian National Curriculum does indeed have the potential to become 'world-class', set to lead in sustainability education.

It must be acknowledged that this is the first time that a national curriculum is being developed in Australia, so there is controversy surrounding it, with many competing interests to satisfy. Nonetheless, the criteria for its development need to disregard sectional interests and observe what is best for learners, for the nation, and for addressing interdependent global concerns, while abiding by international agreements for the creation of a peaceful, just and sustainable world.

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The Global Values within
Education for Sustainable Development

A Case Study of Education for Sustainable Development
in the Australian National Curriculum

Volume 2 - Appendixes

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TABLE OF CONTENTS

ABSTRACT (for Volume 2)

This Volume contains the Appendixes for the thesis submitted for the degree of Doctor of Philosophy, entitled:

The Global Values within Education for Sustainable Development
A Case Study of Education for Sustainable Development in the Australian National Curriculum

In Volume 1, the policy-oriented study examines the nature of global challenges and ways of addressing them through values-based Education for Sustainable Development (ESD), with specific reference to key international and Australian documents and reports. It identifies the most commonly expressed values, knowledge and skills for Education for Sustainable Development (ESD) in a selection of United Nations (UN) documents and international agreements relevant to key socio-cultural, socio-political, socio-economic, and environmental perspectives of sustainable development.

These are collated, analysed and presented as a guide for schooling to address, while complementing local cultural and national values. The global values are compared to Australian values, to those in the National Framework for Values Education in Australian schools (NFVE), and in the Australian National Curriculum for schooling. A set of evaluative criteria for values-based Education for Sustainable Development is also advanced from relevant documents and tested against the developing Australian National Curriculum as a case study.

An investigation of the Australian National Curriculum for Schooling is undertaken to identify the global values, skills, knowledge and evaluative criteria that are involved in implementing values-based ESD, and to examine the extent to which the Australian National Curriculum is designed to service the goal of sustainable development.

This Volume 2 is designed to be read alongside Volume 1, since it contains the collated and summarised information that forms the basis for the analysis and conclusions discussed in Volume 1.

ACRONYMS (for Volume 2)

ACARA	Australian Curriculum Assessment and Reporting Authority
AEC	Australian Education Council
ASEAN	Association of Southeast Asian Nations
ATSI	Aboriginal and Torres Strait Islanders
AuSSI	Australian Sustainable Schools Initiative
CCWA	Curriculum Council of WA
CEL	Center for Ecoliteracy, USA
CPWR	Council of the Parliament of the World's Religions
DECS	Department of Education and Childrens Services, SA
DEETYA	Department of Education Employment Training and Youth Affairs
DEH	Department of Environment and Heritage
DESD	UN Decade of Education for Sustainable Development
DEST	Department of Education Science and Training
DET	NSW Department of Education and Training
DETA	Department of Education Training and the Arts, Queensland
DEWHA	Department of the Environment, Water, Heritage and the Arts
DIC	Department of Immigration and Citizenship
DoE	Department of Education, Tasmania
EFA	Education For All
EfS	Education for Sustainability
ESD	Education for Sustainable Development
ICT	Information and Communication Technology
IIS	International Implementation Scheme for the United Nations Decade of Education for Sustainable Development
MCEECDYA	Ministerial Council, Education Early Childhood Development and Youth Affairs
MCEETYA	Ministerial Council for Education Employment Training and Youth Affairs
NFVE	National Framework for Values Education in Australian Schools
OHCHR	Office of the UN High Commissioner for Human Rights
UDHR	Universal Declaration of Human Rights
UN	United Nations
UNDP	United Nations Development Programme

UNHCHR   UN High Commission for Human Rights

UNLD   United Nations Literacy Decade

Unesco   United Nations Educational, Scientific and Cultural Organization

VCAA   Victorian Curriculum and Assessment Authority

VEGPSP   Values Education Good Practice Schools Project

WPHRE   World Programme for Human Rights Education

WSSD   World Summit on Sustainable Development

APPENDIX 1

Referred to in Chapters 2 and 6, Volume 1

Values expressed in the International Implementation Scheme (IIS) for the UN Decade of Education for Sustainable Development compared with global values

Values in the IIS (See Chapter 2)	[1]**Global Values** (See Chapter 6)
The global values expressed in the IIS are related almost exactly with the global values collated from the 22 international documents listed in full in Appendix 17, except for the global value of 'freedom'	
equality, equity	equality
responsibility	responsibility
democratic participation	democratic participation
cooperation	cooperation
dignity	dignity
-	freedom[2]
security, safety	security, safety
peace	peace, harmony
care, conserve, preserve, protect, restore, steward	protect, preserve
respect	respect
dialogue	dialogue
accountability, transparency	integrity, honesty, accountability
valuing diversity	valuing diversity
tolerance	tolerance
justice	justice
solidarity	solidarity
creativity, innovation	creativity, innovation[3]
commitment	commitment[3]
Values added to ESD in 2010 (See Unesco, 2010)	
social cohesion	peace, harmony, social cohesion
integrity, honesty	integrity, honesty
sustainable living	sustainability[4]

Notes:

1 Global values expressed in 22 other international documents relevant to ESD are listed in Appendix 18.

2 'Freedom' is the only global value not found in the IIS.

3 The global values of 'creativity', 'innovation' and 'commitment' are not listed in the top 16 global values in Appendix 18 since they occur much less frequently in the documents.

4 'Sustainability' and 'sustainable development' appeared frequently in the international documents but are not listed as global values because they are seen as linking to all the global values.

From:

Unesco IIS. 2004. *International Implementation Scheme for the United Nations Decade of Education for Sustainable Development (2005-2014).* Paris: Unesco.

Unesco. 2010. *Unesco Strategy for the Second Half of the United Nations Decade of Education for Sustainable Development.* Paris: Unesco.

APPENDIX 2

Referred to in Chapters 2 and 8, Volume 1

Characteristics of Education for Sustainable Development (ESD)
as described in the International Implementation Scheme (IIS) for the
UN Decade of Education for Sustainable Development

Explicitly values-driven and human rights based
Multidimensional, addressing all aspects of sustainability
Holistic, integrated, systemic approaches for trans-disciplinary understandings
Encouraging of critical and creative thinking, and complex problem solving
Transformative
Multi-method, diverse pedagogies, using active and interactive teaching strategies
Experiential, participatory, inquiry-based learning
Locally relevant, but linked also to global issues
Democratic and participatory decision making, practical citizenship and cooperation
Skills for conflict management, lifelong learning, and using ICTs
Learners contribute to and participate in the learning design
Providing models of sustainability in all aspects of school life

From:

Unesco IIS. 2004. *International Implementation Scheme for the United Nations Decade of Education for Sustainable Development (2005-2014).* Paris: Unesco.

APPENDIX 3

Referred to in Chapter 2, Volume 1

**Scope of the four dimensions of Education for Sustainable Development (ESD)
as described in the Unesco International Implementation Scheme (IIS) for the Decade (DESD)**

Social	Cultural	Environmental	Economic
institutional change	cultural and linguistic diversity	environmental awareness	minimise impacts of economic growth
democracy	respect	impacts of human activity	monitor production and consumption
full civic participation	dignity	consider environment in socio-economic policy	reduce poverty
forging consensus	tolerance of difference	protect and restore ecosystems	corporate responsibility, accountability
policy formulation	open debate and dialogue	protect bio-diversity	equitable distribution of income
decision making	local indigenous knowledge	conserve natural resources	equal employment opportunity
conflict resolution	sustainable agricultural practices	address climate change	market regulation
transparent governance	prevent rural exodus	reduce carbon emissions	socio-economic justice
human rights and dignity	acknowledge diverse worldviews	disaster risk reduction	
peace , human security	foster local languages	sustainable urbanisation	
equity, gender equality	cultural industries and tourism	restore rural environments	
valuing cultural diversity	respect culture and identity		
intercultural understanding			
health, HIV/AIDS			
Note: The dimensions of ESD overlap and interconnect. They are listed here separately by dimension merely to clarify the scope of ESD.			

From:
Unesco IIS. 2004. *International Implementation Scheme for the United Nations Decade of Education for Sustainable Development (2005-2014).* Paris: Unesco.

APPENDIX 4

Referred to in Chapters 4 and 5, Volume 1

Description of Haidt and Joseph's Moral Classification System

Classification	Description
Harm and care	represented the ability to empathise with others, underpinned by virtues of kindness, gentleness, and nurturance, akin to the compassion and harmlessness that emerged during the Axial Age in the East, West and Middle East. It was also advocated by recent feminist writers, as a reaction to an over-emphasis on justice and reason, in particular Gilligan's ethics of care (1982).
Fairness and reciprocity	linked to reciprocal altruism, and a sense of fairness, justice, rights, and autonomy, akin to the Golden Rule in all major religions and civilisations, and the basis of Kohlberg's six stages of moral development (1958).
In-group loyalty	involved the underlying virtues of patriotism and self-sacrifice for the benefit of the collective.
Authority and respect	linked to hierarchical social interactions in the family, community, and institutions, underlying values of leadership, deference, duty, conformity and respect for tradition and legitimate authority, prevalent in Confucian China.
Purity and sanctity	of the body, food and of sexual practices, based on emotional responses of disgust to perceived desecration or defilement by immoral activities or contaminants, sometimes connected with religious belief, prevalent in India during the Axial Age, and found today among Hindus, Muslims, Buddhists and Jewish people.

Adapted from:

Haidt, J. and Joseph, C. 2004. "Intuitive Ethics: How Innately Prepared Intuitions Generate Culturally Variable Virtues." *Daedalus. Fall 2004,* pp. 55-66, Cambridge MA: MIT Press.

APPENDIX 5

Referred to in Chapter 4, Volume 1

Summary examples of Values in Education across time and cultures

Ancient Western Cultures

In classical Greece and Rome, education was directed to forming "harmonious personalities" in which "knowledge, intelligence, appreciation of the arts and spiritual virtues were supreme values" (Faure, 1972, p. 7). Socrates, who equated knowledge and wisdom with the virtues of courage, moderation, piety, and justice, urged others to "care for their souls by trying to understand and acquire these qualities" (Monk and Raphael, 2001, p. 22). Plato considered the goal of education to be both moral and political, to create a just society leading indirectly to happiness, and for the health and beauty of the mind and body (Morsy, 1997, Vol. 3, pp. 339-341). For Aristotle, the purpose of education was to learn the art of living in order to achieve intellectual and moral virtuousness, happiness, freedom, leisure and the complete self-realisation of man, for a peaceful and stable society (Morsy, 1997, Vol. 1, pp. 41-43).

Islamic Cultures

Middle Eastern philosophers and educators exercised significant influence throughout the Middle East as well as the Christian West, and were themselves influenced by Ancient Greek philosophers. It was in the Muslim world that the idea of lifelong education and training was first introduced, particularly in Persia, where the sciences, moral virtues and civic training were emphasised (Faure, 1972, pp. 7-8).

Influenced by Plato, the Persian philosopher Al-Fārābī in the ninth century CE saw the role of education as developing the perfect, virtuous human being, to attain happiness and goodness, so as to become a role model and leader for others. He defined education as "the acquisition of values, knowledge and practical skills by the individual, within a particular period and a particular culture". Al-Fārābī linked moral with aesthetic values, and connected theoretical virtue (i.e. intellectual knowledge) with practical moral virtues (i.e. moral behaviour) as well as with effective power in the practical application of knowledge and skills, directed to the creation of the "ideal community" (Morsy, 1997, Vol. 1, p. 355).

Miskawayh, a notable Muslim philosopher of the Islamic Golden Age, was concerned primarily with ethics and imparting "desirable knowledge, morality, customs and behaviour, to … (develop) the acceptable human model within their society" and to attain happiness. Teaching was seen as "the art of character formation … concerned with the betterment of the actions of the individual" (Morsy, 1997, Vol. 3, pp. 136-137). Miskawayh's later contemporary Avicenna integrated education with philosophy in subjects such as society, knowledge, ethics and human nature. **continued**

For Avicenna, the goal of education was the holistic development of the child, physical, mental and moral, including preparation for employment in a co-operative society, to develop the "upright citizen, sound in body and mind" (Morsy, 1997, Vol. 1, pp. 60). He emphasised the psychological bases of moral education, based on imitating the teacher as role model, and using incentives such as encouragement, persuasion, kindness and a positive environment, combined with preventive measures in the form of punishment or admonition (Morsy, 1997, Vol. 1, pp. 60-67).

Later, in the fourteenth century CE, the sociologist Ibn Khaldūn saw education as the transmission of values, knowledge and know-how, not just through a formal education system but throughout all areas of society (Morsy, 1997, Vol. 3, pp. 7-13). More recent educational thinkers in the Middle East, such as the nineteenth century reformer Al-Boustānī, had to deal with a very different and turbulent, socio-cultural, economic and political context in Lebanon. For this reason, Al-Boustānī saw the purpose of education as being the development of citizens within society, through imitation, experience and judgement, to create a unified nation during a time of modernisation (Morsy, 1997, Vol. 1, pp. 126-127).

In early nineteenth century Egypt, Al-Tahtāwī pioneered a renaissance of Islamic culture and the modernisation of Arab thought and education. His view of education was comprehensive, encompassing both the spiritual and temporal, the material and moral, the mind and body, being global in content and lifelong in duration. Given the needs of the time, he saw education as being directed towards societal modernisation and development, the maintenance of moral standards and the acquisition of knowledge and skills for vocational purposes and prosperity (Morsy, 1997, Vol. 4, pp. 635-636).

In late nineteenth and early twentieth century Egypt, at the time of Alī Mubārak, and later the educational pioneer Al-Qabbānī, education consisted of teaching knowledge, skills and values to form the personality, develop social skills, pass on cultural heritage, and prepare the workforce for societal progress and development. Al-Qabbānī's reforms focused on educational policy and method, drawing on Dewey's pragmatic approach, which included: (a) linking curricula to everyday life and the environment; (b) a learner-centred approach based on learner interests; (c) linking the school environment with nature and the community, akin to current whole school approaches to ESD; (d) applying a project method of 'learning by doing'; and (e) fostering values of democratic participation, responsibility, self-direction and mutual respect. As Minister of Education in Egypt in the 1950s, Al-Qabbānī established the objectives for education as being to: (a) strengthen personal, social and mental development, in particular critical thinking, reasoning and imagination; (b) reinforce citizenship; and (c) promote work-related skills to support the economy (Morsy, 1997, Vol. 3, pp. 356-359).   **continued**

Later Western thinking and the Enlightenment

Western educational thinkers such as Comenius, Rousseau, and Piaget in Europe, Dewey in the United States, and Freire in Latin America, each in their own way, built on the classical Greek and Middle Eastern traditions, by continuing to link education with societal well-being. Comenius, who initiated a universal and democratic approach to education, saw education as not being limited to school and family, but as being part of life in society. Comenius believed that learning occurred through action and experience, and he applied this functional, experiential learning approach to moral education:

> The virtues are learned by constantly doing what is right … it is by learning that we find out what we ought to learn, and by acting that we learn to act as we should … But it is necessary that the child be helped by advice and example at the same time.
> (Morsy, 1997, Vol. 1, p. 182)

The thoughts of Rousseau in eighteenth century Europe have remained relevant to the present day for developing autonomous learners, balancing the cognitive, affective and active, functional or productive aspects of learning, which influenced Pestalozzi's education of the head, heart, and hand. Of particular relevance to ESD, was Rousseau's emphasis on developing the ability to resolve and synthesise the many paradoxes, tensions and contradictions that afflicted society, such as between diversity and universality, freedom and control, and the individual and the collective, that continued to baffle societies (Morsy, 1997, Vol. 4, pp. 423-435).

Montessori, who was also influenced by Rousseau in her approach to experiential learning through the senses based on learner interests, viewed the education of the whole child as contributing to the betterment of the family and society. Montessori emphasised the importance of an appropriate learning environment in which children could flourish through social training by interacting with others, to enable the development of self-responsibility, self-discipline and eventually self-realisation leading to freedom. Montessori also fostered the development of attitudes by means of contemplation, inner discipline and disciplined behaviour (Morsy, 1997, Vol. 3, pp. 169-176):

> … after a period of 'inward concentration' one can attain to 'moral strength'. The moral personality must take its stabilizing strength from methodical 'meditation'; without this strength the 'inner being' remains scattered and unbalanced, is not its own master and cannot utilize its own powers for noble ends. (Morsy, 1997, Vol. 3, p. 174)

While best known for his work on child developmental stages, Piaget also wrote of the socio-political role of education, in particular emphasising that "only education is capable of saving our societies from possible collapse" (Morsy, 1997, Vol. 3, p. 314).

Piaget differentiated between knowledge and wisdom, believing that a scientific approach to education was essential for the development of knowledge, while the "introspective approaches" of philosophy, which included the study of virtues and ethics, led to the development of wisdom (Morsy, 1997, Vol. 3, p. 312). Much later Sternberg (2003) defined wisdom as the balanced application of intelligence, experience, and "considered and deliberative values" toward attaining a "common good" over the short and long term, very much needed today for overcoming the complex problems facing society.

American scholars

The American educator Dewey, believed that "education is the fundamental method of social progress and reform" and that society could be transformed by shaping the "democratic character" and "social spirit" of the child, given the appropriate social and co-operative learning environment. He considered the "task of education in a democratic society was to help children develop the character – the habits and virtues – that would enable them to achieve self-realisation" by using their particular talents to contribute to "the well-being of their community" (Morsy, 1997, Vol. 1, pp. 281-282).

> It is a commonplace of educational theory that the establishing of character is a comprehensive aim of school instruction. (Dewey, 1916, p. 346)

Dewey's contemporary Whitehead, a mathematician and advocate of Process Philosophy, in writing about education in Britain, considered that education should develop culture, self-education (i.e. autonomous learners), deep understanding, and expert knowledge in a field that was of practical use. Although Whitehead advocated the development of intellectual faculties, in particular judgement, logic, reasoning and analysis, he also emphasised the application of theory to real-life complex problems, as well as receptiveness to beauty and humane feeling (Whitehead, 1929), so important for valuing both the natural world and cultural diversity.

Freire in Latin America, whose thinking drew on his work with the oppressed in adult education, developed an educational process that he called 'conscientization' that was also applicable to secondary schooling today. Through praxis and a dialectical approach to education, learners engaged in action and reflection to deepen awareness of their socio-cultural environment and their ability to transform it. Freire advocated democratic freedom of expression to enable learners "to re-create the social world leading to a more just society" (Morsy, 1997, Vol. 3, pp. 452-453).

With the advent of formal, institutionalised schooling in America as well as in Western Europe from the nineteenth century, the values focus in education shifted to the development of honest, hardworking, patriotic persons of good character, along with literacy, intellectual development, and quiet, orderly behaviour, suited to an industrialised workforce.   **continued**

The convenience of the teacher and the school were paramount, with some notable exceptions, contrasting with more recent student-centred approaches based on what was best for the child.

Eastern thinking

Education in the East followed a different path from the Western and Middle Eastern traditions, which were both heavily influenced by the Greeks. Confucius had an immense influence on Chinese education and thinking, in both Ancient and modern China, and across East Asia. Confucius advocated the importance of education both for the individual and society alike, emphasising moral instruction and knowledge, to develop competent and virtuous individuals, for a well-ordered, law-abiding and righteous society (Morsy, 1997, Vol. 1, pp. 212-213). Over 2000 years later, Sun Yat-sen, Cai Yuanpei, and Mao Zedong also linked education closely with societal development, with a continued focus on moral education for the development of the virtuous individual for the benefit of society.

In Confucian thinking, as in Western thinking, education was linked to the well-being of society, however the moral dimension was highlighted far more in the East than in the West which focussed on ethics and virtues. The process of learning through action and experience was de-emphasised in the East, favouring instead the transmission of knowledge, particularly through the written word.

At the beginning of the twentieth century, Cai Yuanpei sought to reform traditional education in China by integrating Western scientific and educational thinking. He advocated greater freedom of thought and expression, and the separation of education from politics and religion through "a new education, which … would be linked organically to society and its culture." This he called "education for a (universal) world view", which he hoped would "foster more altruistic and elevated sentiments … towards understanding the essential unity of all humankind." He also reformed China's moral education, adapting it to the needs of modern China (Morsy, 1997, Vol. 1, pp. 149-152).

Sun Yat-Sen challenged the Confucian and feudal traditions with his revolutionary and egalitarian approach to education as a means of social and national development. His approach consisted of military education, the desired 'world view', civil morality and aesthetic perception, to train individuals in "an all-round harmonious way … to cultivate perfect moral integrity" (Morsy, 1997, Vol. 1, p. 595). Mao Zedong followed Sun Yat-Sen in shaping education in China as "the instrument of the (socialist cultural) revolution" and of the "new democracy". He linked theory and knowledge with practice to build socialism, connecting education with work and socialist action (Morsy, 1997, Vol. 3, p. 96).

Australian Education

Education in Australia has had a shorter history than many other Western countries, with the obvious exception of the educational approach of Australian Indigenous peoples dating back many thousands of years. In the early years of the colony, education necessarily consisted of either private tuition or attendance at church-based schools for those who could afford it, or attendance at a one-roomed, state-funded school house. When free, public and secular compulsory education was introduced in the 1870s, it was initially limited to basic literacy and numeracy, with instruction on how to become a moral, law-abiding citizen, with other subjects being added later. There were strict behavioural rules for children to be orderly, clean, punctual, and courteous, with instruction in the virtues of obedience and self-restraint. Play activities were considered to be opportunities for building character since they reinforced duty to others, and discipline and education was oriented to the needs of the society at that time (Austin, 1972). In the late nineteenth century, education charters of the various Australian States and Territories included statements about the need for education to assure "personal morality" and for "students to be inculcated into the values of their society" (Lovat and Toomey, 2007, p. xii).

During a period of rapid social change after Australian Federation in 1901, public primary and secondary schooling was reorganised with a strong focus on civics, emphasising duty, patriotism, ethics and moral behaviour, such as temperance, industry, honesty, courtesy, punctuality, and regard for property and the public good. At that time, the New Education movement gained sway, advocating child-centred pedagogical reform and freedom of expression, accompanying the civics focus until post-1945 when certain humanities subjects were reformed into social studies (Commonwealth of Australia, 1994, pp. 29-31). After a period of about 30 years, during which civics received less attention, and education was thought to be 'values-neutral', civics and citizenship education were re-introduced into the school curriculum from a broader perspective in the 1990s, based on democratic values and processes (Commonwealth of Australia, 1994, pp. 31-32).

From the earliest days of formal education in Australia, moral, law-abiding behaviour and good citizenship formed a prominent part of education, at first reflecting the Christian roots of the colonies and later reflecting a democratic, secular society. While democratic values implicitly informed the curriculum and underpinned the work of State and Federal education authorities, it was not until 1989 with the Hobart Declaration for the National and Agreed Goals for Australian Schooling that the development of values and attitudes to participate as active and informed citizens in Australian democratic society, were explicitly expressed (AEC, 1989). This was later reinforced in the recommendations of the Civics Expert Group (Commonwealth of Australia, 1994).

The subsequent 1999 Adelaide Declaration on National Goals for Schooling also emphasised the central role of values in education for "Australia's future … in an educated, just and open society" (MCEETYA, 1999). More recently, the 2008 Melbourne Declaration on Educational Goals for Young Australians continued the emphasis on values, but distinguished between 'national' values, such as democracy, equity and justice that were integral to the Australian national tradition, and 'personal' values, such as honesty, resilience and respect for others (MCEECDYA, 2008). In 2004 values were formally and explicitly introduced into Australian curricula with the National Framework for Values Education (NFVE), which emphasised the development of a values-based ethos across the whole school, centred around nine key sets of values (DEST, 2005).

Educational change in the twentieth century

The twentieth century brought many revolutionary changes to educational goals, content and processes to respond to "the impelling forces of industrial expansion, middle class ambition, and nationalism", and examining "the relationship of education to society" following the 1930s depression and the two world wars. Education came to be used "as a means of developing social cohesion and economic strength", accompanied by the values that these emphases entailed (Connell, 1980, p. 5). As education became increasingly part of the public domain, the teaching of history came to be seen as "an efficient vehicle of nationalism and moral education" (Connell, 1980, p. 4).

As international exchange became more prevalent in the twentieth century, Connell identified three trends that impacted on education in many parts of the world, and that in turn influenced educational goals and the type of values that progressively underpinned education.

The politicising of education

Education became politicised in the twentieth century, initially involving values associated with patriotic loyalty, national solidarity, unity and allegiance, and later including concerns for social, economic and political justice and efficiency, and a focus on civics, citizenship and vocational preparation in service to society. It also included a growing awareness of the need to remove discriminatory barriers and to provide equality of opportunity leading to improved living conditions for the disadvantaged. Education therefore became linked increasingly with social reform and reconstruction, thereby broadening its purpose and function.

A concern with (individual and social) betterment through education

As awareness grew in the 1940s of the links between educational performance, behaviour and socio-cultural environment, increasingly education became competitive and valued for the status and wealth that it could provide to individuals, but also for the contribution that it could make to social welfare on the one hand, and national economic production on the other.

A reorienting of the educational process from instructional work to human behaviour

Educational processes became reoriented in the 1960s from instructional work to an interest in the cultivation of a wider range of human behaviour, which transformed the very processes of teaching and learning. The focus shifted to an emphasis on relevance, inquiry, learner activity and the development of the whole child in a nurturing environment, both to fulfil individual potential and for the benefit of society (Connell, 1980, pp. 7-12).

From:

Australian Education Council. (AEC). 1989. *The Hobart Declaration on Schooling: Common and Agreed National Goals for Schooling in Australia*. Hobart: Australian Education Council.

Austin, A. G. 1972. *Australian Education 1788-1900.* Carlton, Victoria: Pitman.

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APPENDIX 6

Referred to in Chapter 4, Volume 1

Characteristics of the Unesco four pillars of learning

Learning to know	Learning to do	Learning to be	Learning to live together
Cognitive *(Head)*	Active/Physical *(Hand)*	Affective *(Heart)*	←Includes all 3 processes
Knowledge	Skills	Values	←Includes all 3 processes
Pleasure of learning Conducting research Discovering Understanding Knowing Learning how to learn Concentration and memory Concrete and abstract thought Critical thinking Inductive and deductive reasoning Construction and integration of new knowledge across disciplines	Creative, innovative application of knowledge Occupational skills Social skills Life skills ICT skills Interpersonal communication Teamwork Managing and resolving conflict Taking initiative and risk Becoming entrepreneurs and agents of change Ability to adapt to wide-ranging vocations Being of service to others Applying ethics to science, Technology and the workplace	All-round development Sensitivity Aesthetic sense Personal responsibility Spiritual values Independence, autonomy Self-responsibility initiative Freedom Discovery Experimentation Imagination Creativity and innovation Personal development Self-knowledge Understanding others Becoming national and global citizens	Peaceful cooperation with others Knowledge, understanding and appreciation of others' cultures and values Mutual respect Equity Peaceful conflict resolution Harmonious interdependence

From:

Delors, J. 1996. *Learning: The Treasure Within. Report of the International Commission on Education for the Twenty-first Century.* Paris: Unesco publishing.

APPENDIX 7

Referred to in Chapter 4, Volume 1

The Seven Tensions of the Delors report

(1)   The local and the global

This tension had implications not only for civics, citizenship and the construction of multiple civic identities at local, national and global levels, but also for understanding the interconnectedness of issues at macro and micro levels, and the consequences of local actions at global levels and vice versa. The International Implementation Scheme (IIS) listed one of the key characteristics of ESD as addressing "local as well as global issues" (Unesco IIS, 2004, p. 5).

(2)   The universal and the individual

This tension had implications for the co-existence in education of shared global values alongside individual personal and collective cultural values, and also for understanding and appreciating cultural, religious and linguistic diversity while retaining one's own individual or collective identity. This aligned with the concept of unity in diversity for learning to live together harmoniously based on a set of shared global values for a collective identity as global citizens, without undermining cultural values and national identities.

(3)   Tradition and modernity

This tension challenged education to retain the best of the past and present, in terms of knowledge, heritage and values for example, while seeking to integrate new technologies, discoveries and understandings towards a preferred sustainable future. The continuity of past, present and future was vital for constantly building on both traditional and modern knowledge, and applying these to new issues as they emerged. This had implications for valuing and preserving traditional and Indigenous minority cultures, languages, and ways of knowing, doing and being.

(4)   The long and short term

This tension had implications for futures studies in education to build understanding of the consequences of actions and decisions in the longer term, and their socio-cultural, economic and environmental impacts, in a rapidly changing, interconnected world, increasingly dominated by instant communications and short term planning. The IIS stated that, "education for sustainable development is a process of learning how to make decisions that consider the long-term future of the equity, economy and ecology of all communities. Education builds the capacity for such futures-oriented thinking" (Unesco IIS, 2004, p. 15).

continued

(5)   Competition and equality of opportunity

This tension challenged the values expressed through current globalising trends and market forces that were underpinned by a competitive, economic paradigm in which equality and equitable outcomes were sacrificed. UNDP claimed that, "competitive markets may be the best guarantee of efficiency, but not necessarily of equity" (UNDP, 1999, p. 2). The challenge for education was to encourage excellence and to strive continually to improve educational outcomes, while promoting equal access and opportunity, as well as equitable outcomes, by investing not only in success but in also redressing disadvantage.

(6)   Expansion of knowledge and human capacity to assimilate it

This tension had significant implications for an integrated, holistic and trans-disciplinary approach to education in a knowledge and information society, for developing the knowledge, skills and values needed by learners to enable them to be critically discerning in their use of and exposure to Information and Communication Technology. Also important for the integrated design of curricula and teaching methods, was to provide students with the skills for learning how to learn, to avoid continually adding content to an already over-crowded curriculum struggling to cope with the rapid expansion in new knowledge.

(7)   The spiritual and the material

This tension highlighted the priority imbalance in education between the instrumental focus on vocational skill development, which contributed to national economic development, and the drawing out of inner qualities and capacities for living together sustainably according to shared global values, upon which "the survival of humanity depends" (Delors, 1996, p. 18).

From:

Delors, J. 1996. *Learning: The Treasure Within. Report of the International Commission on Education for the Twenty-first Century.* Paris: Unesco Publishing. (pp. 16-18)

UNDP, 1999. *Human Development Report 1999. Globalization with a Human Face.* New York: Oxford University Press.

Unesco IIS. 2004. *International Implementation Scheme for the United Nations Decade of Education for Sustainable Development (2005-2014).* Paris: Unesco.

APPENDIX 8

Referred to in Chapter 4, Volume 1

Ten challenges for education in the twenty-first century

(1)   Information and Communication Technology (ICT)

The use of ICT in education has implications for developing critical thinking and values-based discernment of information, when researching the variable quality of information available in the media and on the internet. There is a need for skills in learning how to learn throughout life, to cope with the explosion in knowledge and innovation attributed to rapid advances in the sciences, technology and communications. This also entails information analysis and synthesis across disciplines for integrating and constructing new knowledge, and skills for the ethical application of knowledge and sound decision making, while mindful of socio-cultural, economic and environmental impacts. The increasing use of ICT requires effective communication skills for using a wide range of multi-media, but also for re-emphasising personal, face-to-face communication, teamwork, relationship skills, negotiation and conflict resolution skills, to counter-balance the potentially isolating effects of ICT.

(2)   Quality education and equity

The provision of equal access to quality education is a long-held aspiration of educators, and is more so today given the high rates of illiteracy around the world. Unesco's expanded definition of quality education sought to balance the necessary focus on equitable outcomes in literacy, numeracy and the sciences with the promotion of "life skills, human rights, respect for diversity and a culture that helps people learn to live together … education for justice, liberty and peace is education of quality" (Unesco, 2003, p. 34). The IIS stated that, "the vision and values of sustainable development must be a component of quality education" (Unesco IIS, 2004, p. 16). Equity and sustainability must go hand in hand with an education of quality, while sacrificing neither for efficiency or economic savings. The links between values and quality education are discussed further in later chapters.

(3)   Learning to live together peacefully, humanely and sustainably

It is proposed here that the 'learning to live together' pillar be applied in broader terms of sustainable development, such as stewarding and sharing the world's resources equitably, while promoting intercultural and interfaith understanding, countering racism, intolerance and injustice, and treating each other fairly and humanely. These are essential in an interdependent world, in which intercultural exchange continues to increase, bringing together multidisciplinary and multicultural expertise, enabling cooperative problem solving from diverse perspectives.

(4)   Civics, citizenship and multiple civic identities

Civics and citizenship education are needed to explore the development and clarification of multiple personal and collective identities and citizenship at all levels: local (i.e. cultural, ethnic, Indigenous), national and global, reflecting the reality of interconnected relationships and reconciling potential conflicts. The integration of shared global values in education, with critical thinking, systems thinking and problem solving skills, and responsible civic action, leads to the development of informed, responsible and active citizens who are socially cohesive, and able to monitor social justice and human rights issues, and the health of their environment and democracy.

(5)   Systems and trans-disciplinary thinking

The multidimensional nature of sustainable development requires education to foster a holistic and systemic approach to futures thinking, developing in learners a systems understanding of interdependent relationships, and the consequences of various courses of action. The IIS (Unesco IIS, 2004, p. 20) stated that Education for Sustainable Development (ESD) needed to include "transdisciplinary understandings of social, economic, environmental and cultural sustainability" to enable the construction of new knowledge and find solutions to intractable issues. By synthesising knowledge from a range of disciplines, trans-disciplinary learning enables both horizontal breadth, for an understanding of common principles, processes and methods across disciplines, and vertical depth of knowledge in selected subjects to develop required expertise. Applying values and ethics to scenario-based learning, for envisioning alternative preferred futures and decision making, can foster critical discernment in devising truly sustainable solutions.

(6)   Ethics in the sciences and technology

Ongoing rapid advances in the sciences and technology present new areas for ethical inquiry and debate as the frontiers of what is possible are continually crossed, for example, in the field of biogenetics with particular reference to the human genome. Education needs to provide learners with a solid grounding in ethics and values, to enable them to anticipate potential side-effects of innovation, and to balance the benefits and economic imperatives of applying scientific and technological breakthroughs, with the advancement of human well-being and environmental sustainability.

(7)   Creative thinking and innovative problem solving

Education needs to foster creative thinking and innovative approaches to problem solving based on cross-disciplinary inquiry, to enable new solutions to old and emerging complex problems for securing sustainable futures.

(8)   Futures and transformation skills

Since many complex problems cannot be ameliorated by gradual incremental change, learners need to develop an understanding of the processes of change and transformation, and be able to envision and enact desired, sustainable futures. It is important to prepare learners for adapting readily to inevitable change, and for transforming their personal and working lives while contributing to positive societal change. The IIS stated that, "education is the primary agent of transformation" and should increase capacity "to transform … visions for society into reality … (and) build capacity for futures-oriented thinking" (Unesco IIS, 2004, p. 15).

(9)   Socio-emotional and personal development through values-based service-learning

There is a need for whole person development and socio-emotional learning to promote self-confidence, self-actualisation and resilience in the face of change and cultural diversity. Values-based service-learning fosters the development of values that motivate learners to engage in constructive social, civic or environmental action, thereby contributing to change for a sustainable society, while becoming empowered to bring about change.

(10)   Work-related skills

A continuing focus is needed on both generic and specific work skills, to develop flexibility and adaptability in a changing work force in which new occupations are constantly emerging, for which professional exchange, effective communication and conflict resolution skills are essential. Teamwork and cooperation with colleagues of diverse backgrounds are needed to solve complex, multifaceted problems, find innovative and sustainable work practices, achieve energy efficiencies, and reduce waste and carbon emissions. Values and ethics are also needed for working together in a safe, healthy, cohesive, just, and sustainable workplace.

From:

Unesco IIS. 2004. *International Implementation Scheme for the United Nations Decade of Education for Sustainable Development (2005-2014).* Paris: Unesco.

Unesco. 2003. *32 C/5 Draft Programme and Budget.* Paris: Unesco.

APPENDIX 9

Referred to in Chapter 5, Volume 1

Progression of values expressed in respective Australian National Goals for Schooling

Hobart 1989 [1]	Adelaide 1999 [2]	Melbourne 2008 [3]
	whole learner development	whole person development
		quality of life, well-being for all
	supportive, nurturing environment	
	economic use of resources	economic prosperity
		compete globally
	effectiveness, efficiency	effectiveness
self-esteem	self-esteem, self-worth	self-worth, self-awareness
		personal identity
self-confidence	self-confidence, confidence	confidence
optimism	optimism	optimism
personal excellence	quality, excellence, standards	quality schooling, excellence
respect for learning	enthusiasm for learning	successful learners
equality of opportunity	equity of access and opportunity	equity, access
flexibility, adaptability	flexibility, adaptability	resilience
	productive, enterprising	productive, enterprising, resourceful, initiative
		rewarding, satisfying, fulfilling
personal health and fitness	healthy lifestyle	healthy life
creative	creative	creative, innovative
environmental concern	environmental concern, stewardship	sustain and improve natural and social environments
moral judgement, ethics	moral judgement, ethics	moral, ethical integrity, honesty
	self-responsibility	self-responsibility
		collective responsibility
social justice	social justice	justice, equity
respect for others		respect for others
cultural respect	value cultural richness	cross-cultural respect
	value cultural, linguistic diversity	respect for diversity *(i.e. social, cultural, linguistic, religious)*
	benefit from diversity	cross-cultural communication
	value ATSI cultures	value Indigenous cultures
	non-discrimination	non-discrimination
	reconciliation	reconciliation
	social cohesion	social cohesion
		empathy
active, informed citizenship	active, informed citizenship	active, informed responsible citizenship (i.e. local and global)
	civic appreciation	civic participation
		work for the common good
		democracy
		communication
		collaboration, teamwork
	community partnerships	community partnerships
		connection with communities
		healthy relationships

From: *(from left to right)*

1 AEC. 1989. *The Hobart Declaration on Schooling.*

2 MCEETYA. 1999. *The Adelaide Declaration on National Goals for Schooling in the 21ˢᵗ Century.*

3 MCEECDYA. 2008. *The Melbourne Declaration on Educational Goals for Young Australians.*

APPENDIX 10

Referred to in Chapter 5, Volume 1

Values fostered by Australian National, State and Territory Education Authorities

National	Queensland	New South Wales	Victoria	Tasmania	South Australia	Western Australia[1]	Northern Territory	Australian Capital Territory
Department of Education Science and Technology Strategic Plan 2005-2008	**Queensland Department of Education and the Arts Strategic Plan 2008-2012**	**New South Wales Department of Education and Training 2004**	**VCAA Victorian Department of Education Essential Learning Standards 2005**	**Tasmanian Department of Education Curriculum Values, Purposes and Goals 2000**	**SA Department of Education and Children's Services Statement 2005-2010**	**WA Department of Education and Training, Plan for Public Schools 2008-2011**	**NT Department of Education and Training Strategic Plan 2009-2012**	**ACT Department of Education and Training Strategic Plan 2006-2009**
Caring for our people		Care	Develop self and others Care	Connectedness Sense of community Friendship Care, Compassion Belonging		Care		
Quality outcomes Responsive	Excellence Professionalism High standard of accountability Performance	Excellence	Excellence Effort Engagement Evidence Quality	Achievement Success Excellence	Excellence	Excellence	Professionalism Excellence	Excellence Responsiveness
Equity Fair Flexible		Fairness	Learning for all Social justice Inclusion	Equity	Fairness	Equity		Equity
Free from discrimination		Democracy	Freedom					
	Accountability Integrity	Integrity	Being ethical Trust Honesty	Acting honestly and ethically Integrity	Integrity		Integrity	Transparency
	Respect Treat all with respect, dignity	Respect	Respect and value others	Self respect Respect difference	Respect		Respect	Respect

continued

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National	Queensland	New South Wales	Victoria	Tasmania	South Australia	Western Australia[1]	Northern Territory	Australian Capital Territory
		Responsibility	Responsibility	Responsibility	Responsibility			
Value diversity			Tolerance Understanding	Tolerance Acceptance Respect difference			Inclusiveness Diversity	Inclusivity Diversity Tolerance
	Innovation Creativity			Creativity Enterprise Innovation			Innovation	Innovation
Cooperate Collaborate	Unity in purpose	Cooperation Participation	Work collaboratively	Connectedness Cooperation Sharing Contributing to sustainable community development	Cooperation			Collaboration
	Environmental sustainability		Open mind	Resilience Optimism		Learning		

Note:

1 Western Australia also identified the following **educational values**: 'pursuit of knowledge', 'commitment' to achievement of potential, 'self-acceptance' and 'self-respect', 'respect' and 'concern' for others and their rights, and social and civic 'responsibility' (CCWA, 2005)

From: *(from left to right)*
DEST. 2005a. *DEST Strategic Plan (2005-2008).* Canberra: Department of Education, Science and Technology.
DETA. 2008. *Strategic Plan 2008-2012.* Brisbane: Queensland Department of Education Training and the Arts.
DET NSW. 2004. *Values in NSW Public Schools.* Sydney: New South Wales Department of Education and Training.
VCAA. 2005. *Victorian Essential Learning Standards.* Melbourne: Victorian Curriculum and Assessment Authority.
DoE. 2000. *Tasmanian Curriculum: Values, Purposes and Goals.* Tasmania: Department of Education.
DECS. 2005. *Statement of Directions (2005-2010).* Adelaide, South Australia: DECS.
DET WA. 2008. *Plan for Public Schools (2008-2011).* Perth, WA: Department of Education and Training.
DET NT. 2009. *Strategic Plan (2009-2012): Delivering a Smart Territory through Quality Education and Training.* Darwin, NT: Department of Education and Training.
DET ACT. 2006. *Strategic Plan (2006-2009).* Canberra, Australian Capital Territory: Department of Education and Training.
CCWA. 2005. *Values in the Curriculum. Relationship between Core Values identified in the Western Australian Curriculum Framework and the Australian Government's Values for Australian Schooling.* Perth: Curriculum Council of WA.

APPENDIX 11

Referred to in Chapters 5 and 7, Volume 1

Guiding principles and key elements for good practice in values education

Guiding principles for effective values education:

1. helps students understand, and be able to apply, values such as: care and compassion; doing your best; fair go; freedom; honesty and trustworthiness; integrity; respect; responsibility and understanding, tolerance and inclusion;

2. is an explicit goal of schooling that promotes Australia's democratic way of life and values the diversity in Australian schools;

3. articulates the values of the school community and applies these consistently in the practices of the school;

4. occurs in partnership with students, staff, families and the school community as part of a whole-school approach to educating students, enabling them to exercise responsibility and strengthening their resilience;

5. is presented in a safe and supportive learning environment in which students are encouraged to explore their own, their school's and their communities' values;

6. is delivered by trained and resourced teachers able to use a variety of different models, modes and strategies;

7. includes the provision of curriculum that meets the individual needs of students;

8. regularly reviews the approaches used to check that they are meeting the intended outcomes.

From:
DEST. 2005. *National Framework for Values Education in Australian Schools.* Canberra: Commonwealth of Australia. (p. 5)

Key elements and approaches that inform good practice values education:

1. School planning
2. Partnerships within the school community
3. Whole school approach
4. Safe and supportive learning environment
5. Support for students
6. Quality teaching

From:
DEST. 2005. *National Framework for Values Education in Australian Schools.* Canberra: Commonwealth of Australia. (pp. 6-7)

Recommendations about the principles of good practice in values education

1. It is essential to reach agreement within the school community about the values that guide the school and the language in which they are described.

2. Values education is sustained over time only through a whole school approach that engages all sectors of the school community.

3. School leadership is critical in developing values education as a core part of schooling.

4. Values must be explicitly articulated and explicitly taught.

5. It is critical to student learning that there is consistency and congruence between the values espoused and the values modelled.

6. Professional learning of all teachers is critical at all stages of the development of values education.

7. Developing positive relationships in classrooms and schools is central to values education.

8. Success is achieved when values education is integral to all aspects of school life.

9. Schools working in clusters can foster effective professional development and quality teaching and learning as well as provide support for values education initiatives.

10. Supportive critical friends and mentors contribute markedly to professional development and the values education work of schools.

From: Commonwealth of Australia. 2006. *Implementing the National Framework for Values Education in Australian Schools. Final Report of the Values Education Good Practice Schools Project, Stage 1.* Victoria: Curriculum Corporation.

Ten Principles of Good Practice in Values Education for Australian Schools

1. Establish and consistently use a common and shared values language across the school.

2. Use pedagogies that are values-focused and student-centred within all curricula.

3. Develop values education as an integrated curricular concept, rather than as a program, an event or an addition to curricula.

4. Explicitly teach values so students know what the values mean and how the values are lived.

5. Implicitly model values and explicitly foster the modelling of values.

6. Develop relevant and engaging values approaches connected to local and global contexts and which offer real opportunity for student agency.

7. Use values education to foster consciously intercultural understanding, social cohesion and social inclusion.

8. Provide teachers with informed, sustained and targeted professional learning and foster their professional collaborations.

9. Encourage teachers to take risks in their approaches to values education.

10. Gather and monitor data for continuous improvement in values education.

From: Commonwealth of Australia. 2008. *At the Heart of What We Do: Values Education at the Centre of Schooling. Final Report of the Values Education Good Practice Schools Project, Stage 2.* Victoria: Curriculum Corporation.

APPENDIX 12

Referred to in Chapters 5, 7 and 8, Volume 1

Quality features in key relevant Australian values-based education documents compared to characteristics of ESD

ESD characteristics in the IIS [1]	NFVE [2] and VEGPSP Stages 1 [3] and 2 [4]	2005 EfS Framework [5]	2009 EfS Action Plan [6]	Global Education [7]
values-based, modelled in all aspects of school life	values explicitly articulated, taught and modelled	envision a better future		
multi-dimensional				
trans-disciplinary holistic integrated across curriculum	values integrated across the curriculum to meet individual student needs			
whole school approach participation	whole school approach school planning	whole school approach	participation	whole school involved participation for all
partnerships	democratic participation community partnerships	networks, partnerships	participation partnerships for change	community engaged in developing shared vision
democratic participate in decision making and learning design	student empowerment leadership responsibility for action	governance	participation	active participation in school leadership
action, participation		action, participation	participation	shared ownership
whole school approach	integrated across school			embed in school policies
	review outcomes regularly	curriculum planning curriculum organisation		coordinated curriculum design breadth, depth, sequence
teacher education and training	teacher professional learning			teacher professional development
transformative			transformation, change	manageable rate of change
lifelong learning Education for All using ICTs	authentic, relevant real life learning inclusive, respect diversity	teaching and learning	Education for All lifelong learning	inclusive classrooms
		connected learner	systems thinking to understand connections	
		autonomous learner		
values-based	values-focused pedagogy	values clarification storytelling		

continued

ESD characteristics in the IIS [1]	NFVE[2] and VEGPSP Stages 1[3] and 2[4]	2005 EfS Framework[5]	2009 EfS Action Plan[6]	Global Education[7]
whole school approach	whole school approach	manage school grounds and resources		whole school involved
whole person learning	safe, supportive, respectful student-centred positive relationships			student-centred learning building self-esteem
active, interactive, experiential		experiential		experiential
cooperation				cooperative interdependent
critical and creative thinking	reflective, open-ended	reflective and deep thinker	critical thinking reflection	critical literacy
inquiry based creative thinking		inquiry learning creative thinking		inquiry-based
problem solving managing conflict		problem solving		
contextual local and global practical citizenship	values in local and global contexts	ethical, responsible citizens		active local, global citizenship
quality multi method teaching	varied quality teaching			

From: *(from left to right)*

1 Unesco IIS. 2004. *International Implementation Scheme for the UN Decade of Education for Sustainable Development.* Paris: Unesco

2 DEST. 2005. *National Framework for Values Education in Australian Schools*. Canberra: Commonwealth of Australia.

3 Commonwealth of Australia. 2006. *Implementing the National Framework for Values Education in Australian Schools. Report of the Values Education Good Practice Schools Project – Stage 1. Final Report September 2006*.Victoria: Curriculum Corporation.

4 Commonwealth of Australia. 2008. *At the Heart of What We Do: Values Education at the Centre of Schooling – The Final Report of the Values Education Good Practice Schools Project – Stage 2*. Victoria: Curriculum Corporation.

5 DEH. 2005. *National Environmental Education Statement for Australian Schools*. Educating for a Sustainable Future. Melbourne: Curriculum Corporation.

6 Commonwealth of Australia. 2009a. *Living Sustainably. The Australian Government's National Action Plan for Education for Sustainability*. Canberra: Department of the Environment, Water, Heritage and the Arts.

7 Curriculum Corporation. 2008. *Global Perspectives. A Framework for Global Education in Australian Schools*. Melbourne Australia: Curriculum Corporation.

APPENDIX 13

Referred to in Chapter 5, Volume 1

Australian Sustainable Schools Initiative (AuSSI) Scope of Learning

A Topics addressed initially by AuSSI schools	B Broader issues subsequently addressed by AuSSI schools
Core topics: Water for a sustainable future Energy for a sustainable future Waste for a sustainable future Biodiversity for a sustainable future Climate Change for a sustainable future Transport for a sustainable future Marine and coastal environments for a sustainable future **Additional optional topics:** Sustainable tourism Sustainable agriculture Depletion of natural resources Eco-design Ecology Food production Limits of nature Pollution Protecting and building natural assets Protecting and conserving natural and cultural heritage Forestry matters Natural cycles and systems Use of natural resources	Culture and religion for a sustainable future and diversity of human cultures Indigenous knowledge and sustainability Women and sustainable development Population and development Understanding world hunger Consumerism and Consumer education Intergenerational equity Peace Social justice Access to food, nutrition and health care Health is wealth Advocacy Being ethical, Ethical developments Citizenship, Empowerment Making a difference Class, race, gender, age Equitable distribution of resources, opportunities and wealth Forge connections beyond the local community Networking Foster commitment to place Lifestyle choices Media literacy Nurturing the human spirit Popular culture Relationships Debt, Poverty Developed and developing countries Global economies Social marketing Stewards of the future Technology

From: DEH. 2007. *AuSSI Sustainable Schools* website.
[Online, accessed 14 June 2007]. URL: http://www.environment.gov.au/education/aussi/resources.html

APPENDIX 14

Referred to in Chapter 5, Volume 1

Benefits for students and communities of schools participating in the Australian Sustainable Schools Initiative (AuSSI)

Educational benefits for students:

- knowledge about ecosystems and strategies for waste reduction, reuse and recycling;

- conducting environmental audits;

- learning cooperatively;

- having practical experiences in environmental planning; and

- opportunities for leadership and taking initiative.

Social benefits for the whole school community:

- cooperation and networking (often intergenerational);

- changes in attitudes and behaviour among students, parents and the wider school community;

- improved school image, pride and morale;

- reduced behaviour problems;

- greater co-operation among students; and

- assuming personal responsibility for sustainability.

From:

DEH. 2006. *Comparative Assessment: Australian Sustainable Schools Initiative Pilot Programme in New South Wales and Victoria.* Canberra: Australian Department of the Environment and Heritage. (p. 36)

APPENDIX 15

Referred to in Chapters 5 and 7, Volume 1

Key features of a whole school approach to
Education for Sustainability (EfS) in AuSSI schools

Whole school approach to EfS (Henderson and Tilbury, 2004, p. 44)	Whole school approach to EfS (DEH, 2005, pp. 10-12)
leadership that places sustainability at the centre of planning and practice, through democratic, participatory decision making	school governance and leadership a shared vision
whole school participation in school action and improvement plans	active whole school community participation
school community partnerships	networks and partnerships
participatory learning approaches that promote critical thinking and responsible citizenship	
integration of sustainability across all learning areas in the formal curriculum and in the hidden curriculum	
greening of the school grounds	management of school grounds and physical surrounds
learning both inside the classroom and in outside contexts	
reduction in the school's ecological footprint	school resource management
practitioner reflective practice, research and professional development, with regular monitoring, feedback and evaluation	

From:

Henderson, K. and Tilbury, D. 2004. *Whole school Approaches to Sustainability: An International Review of Sustainable School Programs.* Sydney: Australian Research Institute for Education for Sustainability (ARIES).

DEH. 2005. *Educating for a Sustainable Future. A National Environmental Education Statement for Australian Schools.* Melbourne: Curriculum Corporation.

APPENDIX 16

Referred to in Chapter 6, Volume 1

Collation of global values from 22 ESD-related international documents

UN Charter 1945	Unesco Constitution 1945	UDHR Human Rights 1948	International Convention on the elimination of Racial Discrimination 1969	International Covenant on Economic Social and Cultural Rights 1976	International Covenant on Civil and Political_Rights 1976	Convention on the Rights of the Child 1990	Declaration Toward a Global Ethic 1993	Declaration of Principles on Tolerance 1995	UN Decade for the Eradication of Poverty 1996	Declaration on the Responsibilities of the Present Generations to Future Generations 1997
Peace 49 Harmony 1	Peace 7	Peace 3	Peace 3 Harmony 1 Non-violence 2	Peace 2	Peace 2 Non-violence 1	Peace 4 Non-violence 1 Harmony 2	Peace 17 Non-violence 3 Harmony1	Peace 11 Non-violence 2 Harmony 2	Peace 1	Peace 4
Security 175	Security 1	Security 3	Security 3	Security 5 Safe 1	Security 7 Safety 3	Security 6 Safety 3	Security 2 Safety 1		Security 1	Security 1
Justice 22 Right/s 28	Justice 4 Right/s 7	Justice1 Just 3 Fair 1 Impartial 1 Right/s 54	Justice 3 Just 3 Impartial 1 Right/s 44	Justice 2 Just 1 Fair 1 Right/s 60	Justice 5 Fair 1 Right/s 71	Justice 2 Fair 1 Right/s 76	Justice 7 Just 7 Fair 3 Right/s 25	Justice1 Just 1 Right/s 20	Right/s 3	Justice 2 Fair 1 Rights 10
Dignity 1 Human worth 1 Welfare 1 Well-being 3 Standard of living 1 Health 4	Dignity 2 Welfare 1	Dignity 5 Human worth 2 Welfare 1 Well-being 1 Living standard 2 Livelihood 2 Right to life 1 Health 1	Dignity 3 Health 1	Dignity 3 Welfare 1 Health 4 Living standards 4	Dignity 3 Well-being 1 Health 5	Dignity 8 Human worth 2 Welfare 4 Well-being 6 Humane 1 Humanitarian 4 Living standards 2	Dignity 8 Welfare 3 Well-being 1 Humane 7	Dignity 3	Life expectancy 4 Health 12	Dignity 2 Living conditions 1
Equal/equality 16 Equitable 1	Equal/equality 5	Equal/equality 13 Access 2	Equal/equality 17 Equitable 1 Access 2	Equal/equality 9 Equitable 1	Equal/equality12 Equitable 1 Access 1	Equal/equality 7	Equal/equality 5 Access 2	Equal/equality 2	Equity 1 Equal/equality 2	Equality 1 Equitable 2
Responsibility 20 Duties 9 Obligations 12	Responsibility 7 Duties 4 Obligations 5	Duties 1 Obligations 1	Responsibility1 Duties 1 Obligations 2	Responsibility 6 Duties 1 Obligations 3	Responsibility 7 Duties 3 Obligations 9	Responsibility 5 Duties 4 Obligations 6	Responsibility 17 Duties 3 Commitment 7	Responsibility 3 Duties 1 Commitment 4	Commitment 8	Responsibility 7 Obligation 1
Respect 35	Respect 3	Respect 4	Respect 6	Respect 9	Respect 10	Respect 22	Respect 13	Respect 8		Respect 6

continued

UN Charter	Unesco Constitution	UDHR Human Rights	Elimination of Racial Discrimination	Economic Social and Cultural Rights	Civil and Political Rights	Rights of the Child	A Global Ethic	Principles on Tolerance	Eradication of Poverty	Responsibilities of Present Generations to the Future
Free/freedom 9 Self-determination 2	Free/freedom 4 Liberty 1 Independent 2	Free/freedom 30 Liberty 1 Independent 2	Free/freedoms 13 Independence 2	Free/freedom 27 Liberty 2 Self-determination 2	Free/freedom 32 Liberty 6 Self-determination 2	Free/freedom 22 Liberty 6	Free/freedom 12	Free/freedom 9	Independent 1	Freedom 5 Liberty 1
		Non-Discrimination 4	Non-Discrimination 35	Non-Discrimination 2	Non-Discrimination 6	Non-Discrimination 2	Non-Discrimination 2	Non-discrimination 7		Non-discrimination 2
Cooperation 7 Collective measures 1	Cooperation 10 Collaboration 2 Mutual assistance 1	Cooperation 2	Cooperation 1	Cooperation 4	Cooperation 1	Cooperation 5	Partnerships 8		Cooperation 9	Cooperation 1 Partnership 1
Participation 15 Civil (rights) 1 Voting 40	Democratic 1 Participation 2 Voting 9	Democratic 1 Participation 1 Voting 2	Participation 3 Equal suffrage 1 Voting 6	Democratic 3 Participation 1 Voting 2	Democratic 3 Participation 1 Equal suffrage 1 Voting 8 Citizen rights 1	Democratic 1 Participation 5	Participation 1 Voting 1	Openness 4 Democracy 3 Dialogue 1		Democracy 1
Unite 1 Friendly relations 3 Good neighbours 2	Solidarity1	Friendly relations 1 Friendship 1 Brotherhood 1	Friendly relations 1	Friendship 1	Friendly 1	Solidarity 1 Friendship 1	Solidarity 4 Unity 1 Interdependence2 Relatedness 1 Humankind one family 1	Solidarity 3 Interdependence1 Friendship 1	Solidarity 2	Solidarity 3
Tolerance 1	Understanding 2 Cultural relations 1	Tolerance 1 Understanding 2	Tolerance 1 Understanding 5	Tolerance 2 Understanding 1		Tolerance 2 Understanding 3	Tolerance 3 Understanding 6	Tolerance 41 Understanding 2 Acceptance 1		Tolerance 1 Understanding1
Cultures 1 (i.e. respect for diversity)	Diversity 2					Diversity 2 Identity 4 Culture 12 (i.e. respect for)	Diversity 1 Appreciation 2 Identity 1 Pluralism 1	Diversity 2 Pluralism 2 Appreciation 2		Diversity 6 Heritage 6
Protection 1 Preserve 1	Protect 1 Preserve 1 Conserve 1	Protection 10 Care 2	Protection 6 Care 1	Protection 9 Conservation 2 Care 1 Safeguard 2	Protection 16	Protection 29 Preserve 1 Care 31 Safeguard 3	Protection 7 Preserve 4 Care 5	Care 1		Protect 7 Preserve 6 Care 2 Safeguard 4
Integrity 1	Integrity 2 Truth 1						Truth 17 Trust 10 Honesty 2 Ethical 64	Ethical 1	Ethical 3	Ethical 2
	Exchange 3	Share 1	Share 1		Share 1	Exchange 2	Share 1	Share 1 Dialogue 1	Share 3 Consensus 1	
Consent 3	Concern 1	Consent 1 Privacy 1 Choice 2	Choice 2	Consent 2 Choice 3	Consent 3 Privacy 3 Choice 6	Consent 1 Privacy 2 Love 1	Honouring 1			Prudent 1

APPENDIX 16 (continued)

Universal Declaration on the Human Genome and Human Rights 1999	UN Declaration Programme of Action on a Culture of Peace 1999	Manifesto 2000 for a Culture of Peace and Non-violence	UN Millennium Declaration 2000	Unesco EFA Dakar 2000	Earth Charter 2000	Unesco Universal Declaration on Cultural Diversity 2001	Johannes-Burg Declaration of the WSSD 2002	UNLD Literacy Decade 2003-12	Unesco IIS for the DESD 2005-14	World Programme on Human Rights Education 2005-Ongoing
Peace 4	Peace 36 Non-violence 5 Reconciliation 1	Peace 3 Non-violence 3 Harmony 1	Peace 17 Harmony 1	Peace 24 Harmony 5	Peace 9 Non-violence 5	Peace 3 Social cohesion 2 Harmony 1	Peace 1	Peace 1 Harmony 3	Peace 13	Peace 8 Harmonious 2
	Security 2		Security 5 Safety 3	Security 9 Safety 19	Security 8 Safety 3	Security 1	Security 2	Secure 1 Safe 1	Security 5 Safe 3	Security 4
Justice 2 Just 1 Right/s 36	Just 1 Right/s 14	Justice 2	Justice 9 Fairness 1 Right/s 19	Justice 6 Fair 5 Right/s 77	Justice 6 Just 1 Right/s 13	Justice1 Fair 1 Rights 27	Right/s 1	Right/s 10	Just/justice 16 Right/s 18	Just/justice 3 Fair 2 Right/s 324
Dignity 15 Welfare 1 Well-being 1 Health 7	Dignity 1 Well-being 2 Standard of living 1 Care 1 Health 2	Dignity 2 Well-being 1	Dignity 3 Welfare 1	Dignity 5 Health 54	Dignity 2 Human worth 1 Well-being 5 Health 7 Livelihood 3 Humane 1	Dignity 2	Dignity 3 Decent life 1 Health 1 Humane 1	Quality of life 3 Health 8	Dignity 4 Health 16	Dignity 3 Self esteem 4 Welfare 1
Equal/Equality 2	Equal / equality 5 Equitable 1 Access 1		Equal/equality 7 Equity/equitable 5 Access 6	Equal/equality 49 Equity/equitable 52 Access 100	Equal/equality 2 Equity/ equitable 5 Access 4	Equal 1 Access 8	Equitable 2 Equality1 Access 2	Equal/equality 9 Equitable 3 Access 8	Equal/equality 13 Equity 9 Access 9	Equal/equality8
Responsibility 5 Duties 1 Commitment 1	Responsibility 1	Responsibility 1	Responsibility 4 Duty 2 Commitment 5	Responsibility 47 Duties 4 Obligations 8 Commitment 117	Responsibility10 Duty 1 Obligations 1 Commitment 3	Responsibility1 Duty 1 Obligations 2 Commitment 3	Responsibility 2 Duty 1 Commitment 10	Commitment 3	Responsibility15 Commitment 32	Responsibility 26 Duty 1 Obligation 3 Commitment 5
Respect 14	Respect 3	Respect 3	Respect 10	Respect 23	Respect 4	Respect 7	Respect 3		Respect 27	Respect 9
Free/freedom 16 Liberty 1 Independence 4	Free/freedom 3 Independence 1	Freedom 1 Liberty 1	Freedom 11 Independence 1 Self-Determination 1	Free 12	Free/freedoms 5	Freedom 7 Liberty 1	Free 1 Emancipation 1	Free/freedom 4	Free 2	Free/freedom 9 Autonomy 3 Independent 1
Non-discrimination 6	Non-discrimination 2	Non-discrimination 1	Non-discrimination 2	Non-discrimination 20	Non-discrimination 2				Non-discrimination 2	Non-discrimination 12
Cooperation 7 Collaboration 1 Partnership 1	Cooperation 7 Partnership 1	Work together 2	Cooperation 7 Partnership 1	Cooperation 6 Collaboration 8 Partnership 58 Work together 3	Cooperation 2 Collaboration 2 Partnership 2	Cooperation 8 Partnerships 3	Cooperation 3 Partnership 5 Alliance 1 Act together 1	Cooperation 5 Partnerships 9	Cooperation 36 Partnerships 26 Alliance 11	Cooperation 14 Collaboration 4 Partnership 3

Human Genome and Human Rights	Programme of Action on a Culture of Peace	Manifesto 2000 Peace and Non-violence	UN Millennium Declaration	Unesco EFA Dakar	Earth Charter	Declaration on Cultural Diversity	Declaration of the WSSD	UNLD Literacy Decade	Unesco IIS for the DESD	Human Rights Education
Democratic 1 Civil society 2	Democratic 7 Participation 6	Democratic 1 Participation 2	Democratic 7 Participation 3 Inclusion 2 Openness 2	Democratic 24 Participation 100 Inclusion 27	Democratic 4 Participation 4 Inclusion 2 Civil society 3	Democratic 1 Participation 3 Inclusion 2 Civil society 5	Democratic 1 Participation 1 Inclusive 1	Democratic 2 Participation 15 Inclusion 5	Democratic 6 Participation 27 Inclusion 7	Democratic 9 Participation 34 Inclusive 6
Solidarity 2 Unity 1	Solidarity 5	Solidarity 2	Solidarity 1 Common humanity 1 Interconnected 1 Interdependent 1	Solidarity 9	Solidarity 2 Unity1 Kinship 1 Interconnected 1 Interdependent 4 Common good 2	Solidarity 3 Unity 1 Interdependent 1	Solidarity 1 Interdependent 1	Unity 1 Interdependent 1	Solidarity 2 Unity 1	Solidarity 2 Interdependent 2 Friendship 1
	Tolerance 10 Understanding 5		Tolerance 2 Understanding 1	Tolerance 7 Understanding 9	Tolerance 1 Understanding 2	Tolerance 1 Understanding 2	Tolerance 1	Understanding 1	Tolerance 4 Understanding 26	Tolerance 4 Understanding 6
Diversity 6 Pluralist 2 Heritage 1		Diversity1	Diversity 3	Diversity19	Diversity 8 Heritage 2	Diversity 40 Pluralism 8 Heritage 8 Identity 5	Diversity 3		Diversity 22 Heritage 4	Diversity 4 Appreciation 2
Protect 6 Safeguard 1	Protect 1 Preserve 1 Regenerate 1 Care 1	Protect 1 Preserve 1	Protect 6 Preserve 1 Conservation 2 Stewardship 1	Protect 12 Preserve 3	Protect 15 Preserve 3 Care 7 Concern 2 Restore 3 Safeguard 2	Protect 4 Preserve 2 Safeguard 5	Protection 4 Care 2	Care 3	Protect 13 Conserve 6 Preserve 4 Care 3 Restore 2	Protect 6 Care 1 Concern 1
Honesty 1 Integrity 1 Ethical 11			Transparency 2	Integrity 1 Transparent 9 Accountable 28 Ethical 2	Transparency 2 Accountability 2 Truth 1 Ethical 1	Trust 1 Ethical 1	Transparent 1 Accountable 2		Transparent 5 Accountability3 Ethical 5	Trust 1 Transparency 1 Accountability 5
Dialogue 1 Exchange 4 Open discussion 1	Dialogue 2 Exchange 1 Consensus 1 Negotiate 1 Share 2	Dialogue 1 Share 2	Dialogue 1 Share 6	Dialogue 7 Exchange 10 Share 30 Consensus 13 Agreement 4	Dialogue 1 Exchange 1 Sharing 3 Consensus 1 Agreement 1	Dialogue 4 Exchange 5 Agreement 2	Dialogue 1 Consensus 1	Sharing 2	Dialogue 11 Exchange 25 Share 29 Consensus 11 Agreement 3	Dialogue 1 Exchange 4 Share 8
Consent 4 Confidentiality 2		Generosity 1	Generosity 1 Stability 1	Empowerment 16 Productive 4	Reverence 2 Gratitude 1 Humility1 Wisdom 2 Resilience 1 Empowerment 2 Love 1 Nurture 1	Innovation 2 Creativity 12	Empowerment1 Hope 2 Stability 3	Innovative1	Creativity 4 Innovation 10	Creativity 3 Innovative 4 Stability 2

Notes:
1. The global values listed here are based on an analysis of the texts listed in Appendix 17.
2. 'Diversity' refers to respecting, appreciating, valuing, accepting, acknowledging, honouring or protecting, all forms of diversity.
3. 'Sustainable development' and 'sustainability' are not included as values since these relate to all the values listed here.
4. 'Rights' are not counted in the final synthesis of values since most global values emerged from UN Rights instruments.

APPENDIX 17

Referred to in Chapters 3 and 6, Volume 1

International documents from which global values are collated (in chronological order)

UN. 1945. *The United Nations Charter.* New York: United Nations.

Unesco. 1945. *Constitution of the United Nations Educational, Scientific and Cultural Organization.* Paris: Unesco.

UN. 1948. *Universal Declaration of Human Rights.* New York: United Nations.

OHCHR. 1969. *International Convention on the Elimination of All Forms of Racial Discrimination.* Geneva: UNHCHR.

OHCHR. 1976a. *International Covenant on Economic, Social and Cultural Rights.* Geneva: UNHCHR.

OHCHR. 1976b. *International Covenant on Civil and Political Rights.* Geneva: UNHCHR.

OHCHR. 1990. *Convention on the Rights of the Child.* Geneva: UNHCHR.

CPWR. 1993. *Declaration Toward a Global Ethic.* Chicago: Council of the Parliament of the World's Religions.

Unesco.1995. *Declaration of Principles on Tolerance.* Paris: Unesco.

UN. 1996. *Observance of the International Year for the Eradication of Poverty and proclamation of the first United Nations Decade for the Eradication of Poverty (1997 – 2006).* New York: UN.

Unesco.1997. *Declaration on the Responsibilities of the Present Generations Towards Future Generations.* Paris: Unesco.

Unesco. 1999. *Universal Declaration on the Human Genome and Human Rights.* Paris: Unesco.

UN. 1999. *Declaration and Programme of Action on a Culture of Peace.* New York: United Nations.

Unesco. 2000. *Manifesto 2000 for a Culture of Peace and Non-violence.* Paris: Unesco.

UN. 2000. *United Nations Millennium Declaration.* New York: United Nations.

Unesco Dakar. 2000. *The Dakar Framework for Action. Education For All: Meeting Our Collective Commitments.* Paris: Unesco.

ECI. 2000. *The Earth Charter.* The Netherlands: Earth Charter Initiative (ECI).

Unesco. 2001. *Universal Declaration on Cultural Diversity.* Paris: Unesco.

UN. 2002. *Johannesburg Declaration of the World Summit on Sustainable Development (WSSD).* Johannesburg, South Africa. New York: United Nations.

UNLD. 2002. *International Plan of Action for Implementing the UN Literacy Decade for Education for All.* New York: United Nations.

Unesco IIS. 2004. *International Implementation Scheme for the United Nations Decade of Education for Sustainable Development (2005-2014).* Paris: Unesco.

OHCHR. 2006. *Plan of Action.. World Programme for Human Rights Education (WPHRE), 2005-2009.* Geneva: UN High Commission for Human Rights (UNHCHR).

APPENDIX 18

Referred to in Chapters 6, 8, 9, 12 and 14, Volume 1

Global value sets appearing most frequently in 22 international documents related to sustainable development

(Most frequent global values are grouped together by similar concept or meaning)

Global value sets	Global value sets include:	Frequency
Equality	equality, equal opportunity, equal rights, equal access, equity/equitable, non-discrimination	561
Responsibility	responsibility, duty, obligation, commitment	474
Participation	democratic and equal participation, suffrage, voting, inclusion, civil society	455
Cooperation	cooperation, collaboration, working/acting together, partnership	292
Dignity	dignity, human worth, welfare, well-being, quality of life, decent living standards, access to health care, livelihood	285
Freedom	freedom, liberty, independence, autonomy, self-determination	279
Security	security, safety	278
Peace	peace, non-violence, harmony, social cohesion	267
Protect	protect, preserve, conserve, steward, safeguard, care for others and natural environment	262
Respect	respect	219
Dialogue	dialogue, sharing, exchange, consensus, agreement, open communication	216
Integrity	integrity, honesty, trust, truth, transparency, accountability, ethical	189
Diversity	diversity, pluralism, respect/appreciate/value/acknowledge/ honour and protect cultural, linguistic and natural diversity, heritage, identity	182
Tolerance	tolerance, understanding, acceptance	158
Justice	just, fair	134
Solidarity	solidarity, unity, common good, friendship	85

Notes:
1. 'Sustainable development' and 'sustainability' are not included as values since these relate to all the values listed here.
2. 'Rights' are not counted among the values since most global values emerged from UN Rights instruments.
3. If 'rights' and 'rule of law' were included in the count, 'justice' would easily be the most frequent value with over 600 instances.

Less frequent values appearing in the documents:

love, nurturing, privacy, confidentiality, informed/free consent, innovation, creativity, imagination, empowerment, generosity, gratitude, humility, wisdom, resilience, hope, stability, reverence (i.e. for life and the environment).

From: International documents listed in Appendix 17 and collated in Appendix 16.

APPENDIX 19

Referred to in Chapters 4 and 6, Volume 1

Application of global values to an adaptation of Haidt's moral classification system

Moral System	Global Values	Broadening of moral system
1 fairness and reciprocity	respect, justice, dignity, peace and harmony, cooperation, equality, freedom, responsibility, participation, tolerance, diversity, protect, solidarity, dialogue, integrity	relating not only to own family, community or compatriots but to all cultures, faiths, nations and all life
2 care and protection from harm	respect, justice, dignity, peace harmony, cooperation, equality, freedom, responsibility, tolerance, diversity, security and safety, preserve and protect, solidarity	relating not only to own family, community or compatriots but to all cultures, faiths, nations and all life
3 in-group loyalty	respect, cooperation, equality, participation, tolerance, diversity, preserve and protect, solidarity, peace harmony, dialogue, integrity	solidarity among minority groups and unity of purpose and resolve for all humanity in recognition of shared challenges
4 respect for authority	respect, peace and harmony, cooperation, participation, security and safety, integrity	including respect for the superior ethical authority of the system of principles, values and legal frameworks designed to ensure peace, justice and sustainability
5 sanctity and protection from contamination	respect, justice (i.e. intergenerational), dignity, responsibility, security and safety, preserve and protect, integrity	including recognition of the sanctity of all life and the need to protect living systems, upon which human beings depend for survival, from being polluted or destroyed
6 living in harmony with nature	respect, justice (i.e. intergenerational), peace and harmony, equality, responsibility, diversity, security and safety, preserve and protect, solidarity, integrity	including all aspects of the natural world in own local environment but also globally

Notes:
1 *Fairness and reciprocity*, linked to reciprocal altruism, and a sense of fairness, justice, rights, and autonomy, akin to the Golden Rule found in all major religions and civilisations;
2 *Harm and care* and the ability to empathise with others, underpinned by virtues of kindness, gentleness, and nurturance, akin to the compassion and harmlessness that emerged during the Axial Age in the East, West and Middle East;
3 *In-group loyalty*, underlying virtues of patriotism and self-sacrifice for the benefit of the collective, also prevalent across Axial cultures;
4 *Authority, respect and deference*, linked to hierarchical social interactions in the family, community, and institutions, underlying values of leadership, deference, duty, conformity and respect for tradition and legitimate authority, prevalent in Confucian China;
5 *Purity and sanctity* of the body, food and of sexual practices for example, based on emotional responses of disgust to perceived desecration or defilement by immoral activities and contaminants, sometimes connected with religious belief, prevalent in India during the Axial Age and found among Hindus, Muslims, Buddhists and Jewish people today, among others; and
6 *Living in harmony with nature* s an addition to Haidt's framework to include Indigenous societies and reflect their reverence for nature and for living in harmony with it.

Adapted from:
Haidt, J. and Joseph, C. 2004. "Intuitive Ethics: How Innately Prepared Intuitions Generate Culturally Variable Virtues." *Daedalus. Fall 2004,* pp. 55-66, Cambridge MA: MIT Press. (pp.55-66)

APPENDIX 20

Referred to in Chapters 6 and 12, in Volume 1

Descriptive explanations of global values

(An explanation is provided here for the meaning of each global value listed in Appendix 18)

Equality and Equity – Although these two values are grouped together, there are differences in their meaning. Equality means that all people, regardless of race, cultural background, language, religion, political beliefs, status, age (with some exceptions), gender, or ability should be treated the same, receive comparable benefits and services, and have equal access to opportunities, such as health care, education and employment for example. The principles of equality and universality underpin *The Universal Declaration of Human Rights* (UDHR). Equal treatment however, does not facilitate equitable outcomes, particularly for those who experience socio-economic, geographic or physical disadvantage, marginalisation or negative discrimination for a range of factors. Positive discrimination and the provision of additional services and support to facilitate equitable outcomes are considered indicators of equity and fairness in action, founded on the principle of distributive justice. Equity reflects concern for reducing or eliminating disparities and unequal opportunities for the poor, the disadvantaged and the disenfranchised, and eliminating unjust discrimination.

Responsibility – The value of responsibility also has multiple levels, from the personal to the global, from responsibility for the rights and well-being of another person, group or nation, to responsibility for stewardship of the environment, and civic duties and obligations as national and global citizens. Duty and responsibility go hand in hand with rights and freedoms, and with respect for the rights and freedoms of others, including of future generations. Responsibility is closely aligned with the value of 'solidarity' which is to stand in support of the rights and freedoms of others in recognition of our common humanity and interdependence.

Participation – This refers both to the right and freedom to participate fully in society, socially, culturally, economically and politically in civic life, as well as to the responsibility to participate and to contribute to civic life and to society, often linked to democratic rights.

Cooperation – The value of cooperation is linked with other global values of peace, harmony, unity, solidarity, responsibility and participation. Working cooperatively and harmoniously together at all levels - global, national, local and individual - is necessary for a sustainable future for humanity. Cooperation is distinguished from the term 'collaboration' which generally applies in specific contexts, such as joint scientific endeavour.

continued

Dignity – This is a key term used throughout *The Universal Declaration of Human Rights* (UDHR), which has its origins in humanistic thought regarding the inherent, equal worth of human beings and their inalienable, natural rights, based on the universality of the human condition. Human dignity is therefore linked to respect, justice, equality, freedom, safety, well-being, self-responsibility, participation, self-determination, autonomy, independence, free will and the fulfilment of basic human needs, such as food, shelter, access to education, healthcare and a decent livelihood. With advances in science and technology, the meaning of human dignity continually expands to include for example, the rights of the unborn child, the human genome and human cloning, and the dignity, rights and well-being of future generations.

Freedom and Liberty – These refer to the free will or liberty to act, to speak freely (without harming others), to practise one's own language, culture or faith, and to exercise the full range of human rights, freedoms and responsibilities for human well-being. Conversely, they also refer to freedom from war, violence, abuse, tyranny and discrimination.

Safety and Security – These not only refer to personal and collective protection, safety and freedom from harm, but also to freedom from conflict, war, famine, disease and abuse, and security of basic needs, including shelter, clean water, employment and a decent standard of living for human well-being. Safety and security are therefore linked to fostering human dignity and rights, and to protect these from being eroded in the interests of national security or other interests. Increasingly human security also refers to ensuring sufficient food and water for survival in the longer term, protection from pandemic, natural disasters and the likely effects of climate change on vulnerable populations, such as those on small islands, and in drought ridden or low lying areas.

Peace – Peace is not only the absence of war or conflict. Peace is multidimensional in that it relates to inner personal peace as well as to interpersonal, intercultural, interfaith, inter-group, interstate and international peace, harmony, unity and solidarity. It encompasses all aspects of harmonious and socially cohesive relations among people, including non-violence, non-discrimination, communication, understanding, cooperation, dialogue, negotiation, conflict resolution, reconciliation, tolerance, and respect for others and for diversity, thereby overlapping with several other global value sets. It is also used in various terms such as 'peace-building' and 'peace-keeping'. The term 'harmony', which is more common in the East, is also used when referring to Indigenous worldviews relating to living in harmony with nature.

Preserve and Protect – The many references in the documents to preserving, protecting, caring, nurturing, safeguarding and stewardship, relate not only to ensuring human safety from harm, particularly the vulnerable, but also to preserving cultural and linguistic heritage, the built and natural heritage of humanity, diversity in all its forms, and the earth's resources. The rights of current and future generations are implied in the need to preserve and protect human heritage.

Respect – This refers to interpersonal, inter-group, intercultural, interfaith and international respect among human beings, cultures, faiths, nations but also for all living things, the natural world, the earth's resources and for the needs and rights of current and future generations. This value of 'respect' is considered to be central to sustainability, but may appear different when applied by each culture.

Dialogue – While the term 'dialogue' is not strictly a value, it is a noun describing a process for achieving agreement necessary for peace and harmony to be achieved, and is therefore linked to consultation, conflict resolution and achieving consensus. Implicit within the term are notions of listening and communicating with respect and honesty, for reaching understanding and consensus where there may be disagreement. Successful dialogue requires effective communication, honesty, respect and consideration of others, and thinking skills, for reaching a fair and equitable agreement for all concerned.

Integrity – This value is linked with truth, honesty, ethical behaviour, responsibility and accountability at individual, organisational and national levels. The value of truth implied here, also refers to the search for knowledge, understanding and truth behind events and phenomena, reflected in the ethical research of scientists and reflections of thinkers and philosophers throughout history. The dialogue around whether climate change is caused by human activity or part of a natural earth cycle is a pertinent example of a search for truth clouded by conflicting motives. The link with accountability refers to being held to account for fulfilling promises or carrying out positive actions for collective benefit, for example, rather than causing harm through negligence or personal gain.

Diversity – This refers to the valuing, care, nurturing and respect for all forms of diversity: human, socio-cultural, linguistic, religious and ecological. While the word 'diversity' is itself not a value, the meaning refers to the valuing of difference, whether cultural, racial, linguistic, or of diverse talents and abilities, and of biological diversity. Implied in the meaning are notions of tolerance, harmony and unity in diversity, as well as celebration for the socio-cultural and economic benefits that diversity offers for all humanity.

Implicit also is the need for promotion and preservation of diversity in all its forms, some of which are essential for human survival such as biological diversity for example, important for food and medicinal products. In some contexts the term may also refer to the marginalisation and disadvantage experienced by diverse minority groups, for which solidarity in action are needed to facilitate ready access to rights and services, for achieving equitable outcomes in for example, health, employment and education.

Tolerance – This involves acknowledging, valuing, accepting, understanding, respecting, and appreciating, all forms of diversity: social, cultural and religious. It includes non-discrimination, necessary for peace and socio-economic progress, and the recognition of all human rights and freedoms. The 1995 *Declaration of Principles of Tolerance* defined 'tolerance' as: "harmony in difference ... a moral duty … a political obligation … the virtue that makes peace possible … the responsibility that upholds human rights, pluralism, democracy and the rule of law" (Unesco, 1999, p. 217). This definition alone includes several other global values. In Australia, there is some resistance to the term 'tolerance', which is interpreted as meaning 'to tolerate' or 'to put up with' diversity reluctantly, although this meaning is not intended. It is therefore often replaced with 'acceptance'.

Justice – This term requires special clarification, as it may be interpreted by some to mean retribution, for example, when used to justify military or terrorist action. The intended meaning in the context of global values relates to concepts of equality of treatment, equitable outcomes, fairness, rights, the rule of law, equal access to education, food, clean water, health services, shelter and employment opportunities. In addition to the obvious legal meaning, it often refers to socio-economic, cultural and political equality. It has special relevance for minorities, the disadvantaged and disabled, refugees and the displaced, Indigenous peoples and ethnic minorities and those who may be discriminated against on the basis of gender, culture, language, faith, race, appearance, disability, age or socio-economic status. The global value of 'equality' may be seen as being linked to and flowing from, the value of 'justice'.

Solidarity and Unity – These values are linked closely with cooperation, being united in joint effort to stand together around a shared interest, issue or concern, working together to overcome a common challenge, or standing up against perceived injustice towards themselves or others. Examples of solidarity are the United Nations, the Olympic movement, ASEAN, and at the national level, walks for Aboriginal reconciliation in Australia.

From:
Global values found in 22 International documents listed in Appendix 17.

Unesco, 1999. *Declaration of Principles on Tolerance.* Paris: Unesco.

APPENDIX 21

Referred to in Chapter 6, Volume 1

Global values mapped against Maslow's Hierarchy of Needs

Level	Maslow's Hierarchy of Needs	Global Values
5	Self actualisation	all
4	Self esteem	respect dignity justice equality and non-discrimination freedom and liberty (i.e. intellectual)
3	Social and psychological needs	solidarity dialogue harmony, social cohesion dignity, social well-being cooperation participation tolerance (i.e. acceptance) diversity and pluralism responsibility integrity
2	Safety and security needs	security, safety peace protect, preserve freedom and liberty (i.e. physical)
1	Basic biological and physiological needs	dignity, physical well-being

Adapted from:
Maslow, A.H. 1943. "A Theory of Human Motivation." *Psychological Review, 50, pp. 370-96.*
Washington, USA: American Psychological Association.

APPENDIX 22

Referred to in Chapters 1, 3 and 6, Volume 1
Comparative table of values in the Axial Age by era and culture

Aryans/Indo-Europeans 1500 BCE	Under Zoroaster 1200 BCE	China from 1100 BCE	India 800 BCE	Israel 800 BCE	Greece 700BCE	India - Jains 400 BCE	India - Buddha 400 BCE	Mohammed 600 CE
loyalty		filial piety						
truth	truth	sincerity	truth		truth, reality, logic, reason, knowledge	honesty	honesty	
reciprocity								
self-sacrifice	discipline	moderation self-control	self-denial	suffering self-effacing self-responsibility	responsibility detachment temperance prudence	restraint self-control	self-restraint selflessness detachment equanimity	responsibility
respect for all life	respect for life/property	respect modesty humility		mutual respect and for all life			humility	respect
	justice	altruism, justice humaneness, human dignity, fairness		justice, equity social justice protection of weak and poor	social justice, equality, rights, solidarity for good of whole			egalitarianism just society
	peace security	harmony, peace non-violence security	inner peace non-violence harmlessness	non-violence	peace	harmlessness	inner peace non-violence harmlessness	
	environmental care							
	patience					patience		
	courage			courage	courage			
		generosity kindness benevolence	kindness	kindness generosity benevolence	goodness inner beauty generosity	kindness goodwill benevolence	loving kindness benevolence	generous wealth sharing
		compassion empathy		compassion empathy, care	empathy, pity compassion	empathy care compassion	empathy compassion	compassion care
		wisdom self-development	self-knowledge	conscious awareness	wisdom self-reflection		wisdom enlightenment	
		sacredness reverence		sanctity of life		unity with life		
				impersonal love		universal love		
		virtues, ethics honour, noble		ethical behaviour	morality virtues, ethics		morality	
				right to freedom	free speech, dialogue			
					democracy citizenship			

From: Armstrong, K. 2006. *The Great Transformation.* London: Atlantic Books.

APPENDIX 23

Referred to in Chapter 6, Volume 1

The 'Golden Rule' expressed across World Faiths

Ancient Greece:
"Do not do unto others what angers you if done to you by others." *Isocrates (436-338 BCE)*
"Refraining from doing what we blame in others." *Thales (quoted in Diogenes Laertius, vol I, page 39)*

Bahá'í:
"Ascribe not to any soul that which thou wouldst not have ascribed to thee, and say not that which thou doest not." "Blessed is he who preferreth his brother before himself." *Baha'u'llah*
"And if thine eyes be turned towards justice, choose thou for thy neighbour that which thou choosest for thyself." *Epistle to the Son of the Wolf*
"Lay not on any soul a load which ye would not wish to be laid upon you, and desire not for anyone the things ye would not desire for yourselves." *Baha'u'llah*, Gleanings, 128

Buddhism:
"A state that is not pleasing or delightful to me, how could I inflict that upon another?" *Samyutta Nikaya*
"Hurt not others in ways that you yourself would find hurtful." *Udana-Varga 5:18*
"Comparing oneself to others in such terms as Just as I am so are they, just as they are so am I, he should neither kill nor cause others to kill." *Buddhism. Sutta Nipata 705*
"Just as a mother would protect her only child with her life, even so let one cultivate a boundless love towards all beings." Khuddaka Patha, from the *Metta Sutta*

Christianity:
"Do to others as you would have them do to you." Luke 6:31
"Therefore all things whatsoever ye would that men should do to you, do ye even so to them." *Matthew*
"You shall love your neighbor as yourself." *Matthew 22.36-40*

Confucianism:
"Do not do to others what you do not want them to do to you" *Analects 15:23*
"Tse-kung asked, 'Is there one word that can serve as a principle of conduct for life?'
Confucius replied, 'It is the word 'shu' -- reciprocity. Do not impose on others what you yourself do not desire." *Doctrine of the Mean 13.3*
"One should not behave towards others in a way which is disagreeable to oneself" *Mencius VII.A.4*
"Benevolence means 'man'. When these two are conjoined, the result is 'the Way'. *Mencius, VII.B.16*

Hinduism:
"This is the sum of duty: do naught to others which would cause you pain if done to you." *Mahabharata*
"A superior being does not render evil for evil... One should never harm the wicked or the good or even criminals meriting death. A noble soul will ever exercise compassion even toward those who enjoy injuring others - for who is without fault?" *Ramayana*
"What sort of religion can it be without compassion? You need to show compassion to all living beings. Compassion is the root of all religious faiths." *Basavanna; Vacana, 247*

Islam:
"No one of you is a believer until he desires for his brother that which he desires for himself."
40th Hadith of An-Nawawi 13

Jainism:
"A man should wander about treating all creatures as he himself would be treated." *Sutrakritanga*

continued

"A sage is ingenuous and leads his life after comprehending the parity of the killed and the killer. Therefore, neither does he cause violence to others nor does he make others do so." *Acarangasutra 5*
I forgive all beings, may all beings forgive me, I have friendship towards all, malice towards none. *Pratikraman Sutra 35:49*

Judaism:
"...thou shalt love thy neighbor as thyself." *Leviticus 19:18*
"What is hateful to you, do not do to your fellow man." *Talmud: Shabbat 31a*
"Aid an enemy before you aid a friend, to subdue hatred." *Baba Metzia*

Roman Pagan:
"The law imprinted on the hearts of all men is to love the members of society as themselves."

Shinto:
"The heart of the person before you is a mirror. See there your own form."

Sikhism:
"Compassion-mercy and religion are the support of the entire world." *Japji Sahib*
"Don't create enmity with anyone as God is within everyone." *Guru Arjan Devji, 259*
"No one is my enemy, and no-one a stranger and everyone is my friend. I get along with everyone"
Sri *Guru Granth Sahib: p 1299*

Sufism:
"The basis of Sufism is consideration of the hearts and feelings of others. If you haven't the will to gladden someone's heart, then at least beware lest you hurt someone's heart, for on our path, no sin exists but this."
Dr. Javad Nurbakhsh, Master of the Nimatullahi Sufi Order

Taoism:
"Regard your neighbor's gain as your own gain, and your neighbor's loss as your own loss."
T'ai Shang Kan Ying P'ien
"I am good to the man who is good to me, likewise, I am also good to the bad man." *Tao Te Ching*
"Do good to him who has done you an injury." *Tao Te Ching*
"He who can find no room for others lacks fellow feeling, and to him who lacks fellow feeling, all men are strangers." *Chuang Tzu*

Unitarian *principles*:
"We affirm and promote respect for the interdependent of all existence of which we are a part."

Wicca:
"An it harm no one, do what thou wilt" *The Wiccan Rede*

Yoruba (Nigeria):
"One going to take a pointed stick to pinch a baby bird should first try it on himself to feel how it hurts."

Zoroastrianism:
"That nature alone is good which refrains from doing unto another whatsoever is not good for itself"
Dadistan-i-dinik 94:5
"Whatever is disagreeable to yourself do not do unto others." *Shayast-na-Shayast 13:29*

From:
[Online, accessed 11 October 2007]. URL: http://www.interfaith.org.uk/publications/connect-web.pdf

APPENDIX 24

Referred to in Chapter 6, Volume 1

Comparison between Australian and global values and the values in the National Framework for Values Education in Australian Schools (NFVE)

A. Global Values	B. Australian Values	C. National Values in Australian schools
Equality	equality, fair go	fair go, inclusion
Responsibility	responsibility	responsibility
Participation	participation, democracy, equal opportunity	fair go, inclusion
Cooperation	mateship, team work	-
Dignity	well-being, social justice, fair go	fair go, care, compassion
Freedom, liberty	freedom	freedom
Security, safety	safe schools, workplace, national security	-
Peace, harmony	social cohesion, harmony	understanding, respect, tolerance
Protect, preserve	environmental conservation	care, responsibility
Respect	respect	respect
Dialogue	free speech	-
Integrity, honesty, accountability	professional ethics, separation of powers and accountability	honesty, integrity, trustworthiness
Diversity, pluralism	diversity, pluralism, multiculturalism	understanding, respect, tolerance
Tolerance	tolerance, acceptance	tolerance, inclusion, respect
Justice	justice, fairness, fair go	fair go
Solidarity, unity	mateship	-
-	-	doing your best
Note: 'Safety', 'cooperation', 'solidarity' and 'dialogue' are four Global Values that do not appear in the National Framework for Values Education in Australian Schools (NFVE).		

From:

A   22 International documents listed in Appendix 17.

B   Australian Citizenship Council. 2000. *Australian Citizenship in a New Century*. Canberra: Commonwealth of Australia.

DIC. 2007. *Statement of Australian Values*. Canberra: Department of Immigration and Citizenship, Commonwealth of Australia.

Commonwealth of Australia. 1995. *The Australian Constitution*. Canberra: Australian Government Publishing Service.

Horne, D. 1997. *The Avenue of the Fair Go*. Australia: HarperCollins Publishers.

C   DEST. 2005. *National Framework for Values Education in Australian Schools*. Canberra: Commonwealth of Australia.

APPENDIX 25

Referred to in Chapters 7 and 8, Volume 1

Comparison of quality education features from international documents relevant to values-based ESD

Unesco IIS	EFA Dakar 2000	WPHRE	Unesco Ministers	Unesco Asia-Pacific	Unesco EFA 2005
values-based values are modelled sustainability is modelled	knowledge, skills, attitudes and values	teaching and modelling human rights and universal, democratic values	shared universal, moral and ethical values	values based	observe individual values-based rights transmission of values
interdisciplinary holistic embedded across curriculum				multi-disciplinary	
critical thinking problem solving search and apply new knowledge			future-oriented thinking	critical thinking problem solving	
high quality multi-method pedagogies					
participatory decision making	participatory governance respect for and engaging local communities and cultures	participatory active empowering democratic	participation of all stakeholders solidarity	participatory empowering	equal access
locally relevant linked to global concerns	relevant curriculum that builds on the knowledge and experience of teachers and learners	relevant to daily life	local and global democratic citizenship human rights sustainable development	globally and locally specific	relevance transmission of local and global values
learner-centred lifelong learning	healthy well-nourished motivated students active, child-centred learning	child-centred age-appropriate experiential individually-suited socio-emotional development self-esteem cooperation, creativity	participative	from teaching to learning lifelong and continuous multi-sourced and accessed learning with peers	cognitive, creative and socio-emotional development

Unesco IIS	EFA Dakar 2000	WPHRE	Unesco Ministers	Unesco Asia-Pacific	Unesco EFA 2005
	well-trained teachers clear, accurate assessment of learning outcomes				
high quality learning materials	adequate facilities and learning materials				
	welcoming, gender sensitive, healthy, safe environment,	welcoming, inclusive, child-friendly, secure, trustful, democratic environment			supportive, empowering, rights-based, democratic, learning environment
equality Education for All	Education for All	equal opportunity diversity non-discrimination solidarity	equal access to education and equitable outcomes	sensitive to gender diversity	equal education access peace, security citizenship equality observe student rights

From: *(from left to right)*

Unesco IIS. 2004. *International Implementation Scheme for UN Decade for Education for Sustainable Development.* Paris: Unesco. (p. 16)

Unesco Dakar. 2000. *The Dakar Framework for Action. Education For All.* Paris: Unesco. (p. 17)

OHCHR. 2006. *Plan of Action. World Programme for Human Rights Education (WPHRE), 2005-2007.* Geneva: UNHCHR. (pp. 14-21)

Pigozzi, M. J. 2004. *The Ministerial Viewpoint on Quality Education.* Geneva: IBE.

Unesco EFA. 2005. *EFA Global Monitoring Report. Understanding Education Quality.* Paris: Unesco. (pp. 29-30)

Unesco Bangkok. 2005b. *A Situational Analysis of ESD in the Asia-Pacific Region.* Bangkok: Unesco. (p. 60)

APPENDIX 26

Referred to in Chapter 7, Volume 1

Moral development perspectives relevant to values education for ESD

NOTE:
This appendix is included on page 47 of the print copy
of the thesis held in the University of Adelaide Library.

Adapted from:
Furco, A. 2006. *Unpacking the Nature of Values Education in Primary School Settings.* Berkely: International Center for Research on Civic Engagement and Service-Learning, University of California. URL accessed 6 April 2008: http://education.qld.gov.au/curriculum/values/docs/andy-furco.ppt (Compiled by R. Langer, University of California, Berkeley, USA)

APPENDIX 27

Referred to in Chapter 7, Volume 1

Whole person competencies for Education for Sustainable Development (ESD)

Head	Heart	Hands	Spirit
ecological knowledge

systemic thinking

critical thinking

creative problem solving

assess impacts of technologies and actions

long-term vision of consequences of decisions

apply environmental ethics to new situations | deeply felt concern for the well-being of Earth and all living things

empathy and ability to see from and appreciate multiple perspectives

commitment to equity, justice, inclusivity and respect for all | build, govern and sustain communities

apply ecological knowledge to design

create and use tools, objects and procedures for sustainability

assess and make adjustments to energy and resource use;

convert convictions into practical, effective action | sense of wonder

reverence

deep appreciation of place

feeling of kinship with the natural world and ability to invoke that feeling in others |

Adapted from:

CEL. 2008. *Sustainability and Schools.* USA: Centre for Ecoliteracy (CEL). [Online, accessed 5 June 2008]. URL: http://www.ecoliteracy.org/education/schools.html

APPENDIX 28

Referred to in Chapters 2 and 8, Volume 1

Issues to inform ESD curriculum content from the Unesco International Implementation Scheme for the UN Decade for ESD

Social/Political Dimension	Cultural Dimension	Environmental Dimension	Economic Dimension
Human Rights and dignity Socio-economic justice Equity, solidarity Basic education, literacy Threat to minorities, marginalised Indigenous peoples and their habitat Support handicapped, poor, nomads, migrants, aged, ethnic or linguistic minorities, ill or infirm	**Cultural/Linguistic Diversity** Respect for diversity Tolerance for difference Cultural identity, self-esteem Culturally diverse views of nature and society	**Natural heritage and resources** Improve air and water quality Use of renewable energies Prevent environmental degradation Conserve natural resources, preserve biodiversity Protect/restore ecosystems, forests Protect natural heritage Care and stewardship of natural world	**Poverty reduction** Eliminate poverty, suffering Employment Socio-economic justice Effects of globalisation Improve quality of life for the most deprived and marginalised
Peace and Human Security Peaceful coexistence, nonviolence Food and water security Migration and settlement Conflict resolution	**Intercultural understanding** Peace, non violence Tolerance Resolution of difference Cultural exchange	**Climate change** Impacts of human activity on environment	**Corporate responsibility and accountability** Ethical governance Transparent systems Environmentally and socially responsible development Intergenerational responsibility Ethical use of science/technology Limits and potential to growth Impact of growth on environment
Gender equity Gender equality	**Cultural heritage** Cultural and linguistic diversity Local traditional knowledge	**Rural transformation** Minimise rural exodus	
Health Eliminate hunger, malnutrition HIV/AIDS	**Cultural industries** Cultural tourism Economic development from sale of cultural goods Use of Indigenous knowledge of flora and fauna Indigenous sustainable water use and agricultural practices	**Sustainable urbanisation** Population growth Pollution - air, water, toxins Waste management and reduction Sustainable habitat, food, water, air Sustainable lifestyles	
Governance Democracy and active, responsible, participative citizenship Social change and new patterns of social organisation Community engagement, dialogue Transparent and just social systems and institutions Partnerships and cooperation		**Disaster management** Disaster prevention, preparedness, mitigation	**Market economy** Sustainable and responsible patterns of production and consumption Forms of economic organisation Cultural goods and tourism Integrate environmental concerns in social economic policy

From:
Unesco IIS. 2004. *International Implementation Scheme for the United Nations Decade of Education for Sustainable Development*. Paris: Unesco.

APPENDIX 29

Referred to in Chapter 8, Volume 1

Core issues for Education for Sustainable Development in the Asia Pacific Region

ESD Issues	Examples
Information and awareness	Eco-media, media literacy, ICTs
Knowledge systems	Learning for local and Indigenous knowledge, integrating traditional and modern technologies
Environmental protection and management	Biodiversity, climate change, natural resources, conservation
Peace and equity	Conflict resolution, peace, equity, appropriate development, democracy
Local context	Community development, empowerment
Transformation	Rural transformation, urbanisation, sustainable habitat, water, sanitation, public infrastructure
Culture	Diversity and intercultural and interfaith understanding
Cross-cutting issues and themes	Human rights, citizenship, gender equality, sustainable futures, holistic approaches, innovation, partnerships, sustainable production and consumption, governance
Health	HIV/AIDS and malaria eradication
Environmental Education	Integrated pest management, environmental awareness, community recycling programmes
Engagement of leaders	Professional training courses, executive education, partnerships, networking

From:
Unesco Bangkok. 2005a. *Asia Pacific Regional Strategy for Education for Sustainable Development.* Bangkok, Thailand: Unesco Asia and Pacific Regional Bureau for Education. (p. 4)

APPENDIX 30

Referred to in Chapter 8, Volume 1

Sustainability issues in the 2005
National Environmental Education Statement for Australian Schools

Social	Ecological	Political	Economic
Basic human needs Cultural diversity Cultural heritage Human rights Intergenerational equity Participation Peace Risk management Social justice	Biodiversity Habitat Carrying capacity Conservation Ecological footprint Ecology Ecospace Ecosystems Interspecies equity Natural cycles and systems	Citizenship Democracy Decision making Tolerance Power Respect Conflict resolution	Cost-benefit analysis Economic development Eco-efficiency Life-cycle analysis Natural capital Natural resource accounting Steady-state economy Sustainable consumption Sustainable production Triple bottom line

Cross dimensional knowledge and understandings

Interrelated nature and function of ecological, social, economic and political systems.
Impact of people on environments and how the environment shapes human activities.
How cultures view the importance of sacredness in the environment.
Role of cultural, socio-economic and political systems in environmental decision making.
Principles of ecologically sustainable development.
Responsibilities and benefits of environmental citizenship, including conservation and protection.
Respecting and conserving Indigenous knowledge and cultural heritage.
Changing and uncertain nature of knowledge requiring caution in environmental interactions.

From:
DEH. 2005. *Educating for a Sustainable Future. A National Environmental Education Statement for Australian Schools.* Melbourne: Curriculum Corporation. (pp. 9-17).

APPENDIX 31

Referred to in Chapter 8, Volume 1

Sustainability content suggested in the 2010 Sustainability Curriculum Framework

NOTE:
This appendix is included on page 52 of the print copy
of the thesis held in the University of Adelaide Library.

From:
Commonwealth of Australia. 2010. *Sustainability Curriculum Framework. A guide for curriculum developers and policy makers.* Canberra: Australian Government Department of Education, Employment and Workplace Relations. (pp. 13-35)

APPENDIX 32

Referred to in Chapters 8, 9, 11 and 14, Volume 1

Combined list of sustainability issues to inform ESD curriculum content

Social/Political Perspective	Cultural Perspective	Environmental Perspective	Economic Perspective
Human Rights and dignity Social justice Basic human needs Socio-economic justice Gender equality, equity, solidarity Threat to minorities, the marginalised, Indigenous peoples and their habitat Support handicapped, poor, nomads, migrants, aged, ethnic linguistic minorities, the very ill Basic education, literacy	**Cultural/Linguistic diversity** Respect for diversity Tolerance for difference Cultural identity and self-esteem Culturally diverse views of nature and society Social systems, sub systems and culture Non discrimination	**Natural heritage and resources** Air and water quality, water technologies Forces, renewable energies, non renewable fuel, solar system Prevent environment/land degradation Preserve natural resources, biodiversity, natural heritage Restore ecosystems, forests, habitats, fish stocks Living things, systems, natural life cycles, growth, change, evolution Biosphere, Ecospace Care and stewardship of natural world Sustainable futures Carrying capacity Ecological footprint Interspecies and intergenerational equity Map, monitor, assess living systems, Ecological sustainability Biochemistry and structure of the Earth	**Poverty reduction** Eliminate poverty, suffering Employment Socio-economic justice Effects of globalisation Improve quality of life for the most deprived and marginalized **Corporate responsibility/accountability** Ethical governance Transparent systems Environmentally and socially responsible development Intergenerational responsibility Ethical use of science and technology Limits to growth and impact of growth on environment Risk management Eco-efficiency Life-cycle analysis Triple bottom line Cost-benefit analysis
Peace and Human Security Peaceful coexistence, non violence Food and water security Migration and settlement Conflict resolution	**Intercultural and Interfaith understanding** Peace, non violence, tolerance Resolution of difference Cultural exchange Sacredness of environment	**Climate change** Impacts of human activity on the environment Weather and climate, seasons Intergenerational equity	

Social/Political Perspective	Cultural Perspective	Environmental Perspective	Economic Perspective
Health Eliminate hunger, malnutrition HIV/AIDS, malaria Substance abuse Safety, disease, pandemic	**Cultural heritage** Cultural and linguistic diversity Local and traditional Indigenous knowledge and cultural heritage	**Rural transformation** Minimise rural exodus Integrated pest management Agriculture and food production	**Economic development - Market Economy** Materials for production, and consumption Economic organisation, systems and costs
Governance Civics, democracy, active, responsible, participative and environmental citizenship Environmental decision making Community engagement Community development and empowerment Dialogue Social change Transparent and just social and political systems and institutions Partnerships and cooperation Ethical use of power Eco-media, media literacy ICTs Risk management	**Cultural industries** Cultural tourism Economic development from sale of cultural goods Use of Indigenous knowledge of flora and fauna Indigenous sustainable agricultural practices and water use Integrating traditional and modern technologies	**Sustainable urbanisation** Population growth Pollution - air, water, toxins Materials reduction and waste management, recycling Sustainable habitat, food, water, air, sanitation Sustainable lifestyles Public infrastructure Built environment technologies Transport **Disaster management** Disaster prevention, preparedness and mitigation Risk reduction and management	Cultural goods and tourism Integrate environmental concerns in social economic policy Ecologically sustainable development Natural capital and resource accounting Steady-state economy Ownership, value and property rights

From:

Unesco IIS. 2004. *International Implementation Scheme for the United Nations Decade of Education for Sustainable Development (2005-2014).* Paris: Unesco.
UNESCO Bangkok. 2005a. *Asia Pacific Regional Strategy for Education for Sustainable Development.* Bangkok: Unesco. (p. 4)
DEH. 2005. *Educating for a Sustainable Future. The National Environmental Education Statement for Australian Schools.* Melbourne. (pp. 9-17)
Commonwealth of Australia. 2010. *Sustainability Curriculum Framework. A guide for curriculum developers and policy makers.* Canberra. (pp. 13-35)

APPENDIX 33

Referred to in Chapters 2 and 8, Volume 1

**ESD skills in the International Implementation Scheme
for the UN Decade of Education for Sustainable Development**

Cognitive Skills	Practical/functional Skills
creative/innovative thinking	literacy
critical thinking	oral/written communication, articulating, listening
planning	express opinions, engage in open dialogue/debate
problem solving	networking, exchange, interaction, partnerships
participatory decision making	work together, cooperate, collaborate
systems thinking	active learning
futures-oriented thinking	manage conflict, resolve difference, negotiate consensus
analytical thinking	skills for peace
reflecting	using ICTs
critical appreciation of knowledge	active, practical, civic participation and action
lifelong learning skills	life and work skills
understand diversity, sustainability	creating positive change and societal transformation
trans-disciplinary understandings	care, protect, preserve, conserve, restore (i.e. nature)
visioning sustainable futures	using the language of sustainable development
assessing, monitoring, evaluation	observe, copy, experiment, learn from mistakes
advocacy, lobbying	
recognise diversity, respect difference	
to search out and apply knowledge	
explore (e.g. sustainable solutions)	

From:

Unesco IIS. 2004. *International Implementation Scheme for the UN Decade of Education for Sustainable Development.* Paris: Unesco.

APPENDIX 34

Referred to in Chapter 8, Volume 1

Skills for Education for Sustainable Development (ESD) identified by McKeown

Skills in the ESD Toolkit (McKeown, 2002, p. 20)	Skills in : (McKeown, 2005, pp. 5-6)
communicate effectively (orally, writing) think about systems (natural, social sciences) think in time - forecast, think ahead, plan think critically about value issues separate number, quantity, quality, value move from awareness to knowledge to action work cooperatively with others aesthetic response to the environment **Capacity to use these processes:** knowing, inquiring, acting, judging, imagining, connecting, valuing, choosing	critical-thinking data/information organization and interpretation question formulating issue analysis participation in democratic society decision making self-management, manage emotions and stress self-efficacy, empowerment, internal control life skills for living sustainably cognitive skills, critical reflection, lifelong learning s ability to adapt to change interpersonal psycho-social skills empathy, compassion interpersonal communication, negotiation, advocacy assertiveness (including refusal) cooperation, teamwork

From:

McKeown, R. 2002. *Education for Sustainable Development Toolkit (Version 2)*. USA: Waste Management Research and Education Institution.

McKeown, R. 2005. *Quality Education for Sustainable Development: One route to develop and fulfil human capabilities*. USA: University of Tennessee.

APPENDIX 35

Referred to Chapters 8, 9, 10 and 14, Volume 1

Combined list of sustainability skills to inform ESD curriculum development categorised according to the Unesco four pillars of learning

Learning to know skills	Learning to do skills
Identify, monitor, evaluate, assess, judge Critical thinking, think critically about values issues Critical appreciation of knowledge Critical reflection, reflective, deep thinking Higher-order thinking Creative and innovative thinking Consider/predict consequences of courses of action Challenge preconceived ideas Think in time - forecast, think ahead, plan Futures-oriented thinking and design to visualise, model, formulate preferred, constructive futures, and viable solutions Problem solving, explore sustainable solutions Generate, select, develop and modify ideas for change Develop proposals making the case for change Participatory, ethical, responsible, decision making Systems thinking, thinking about natural and social systems Analytical thinking, issue analysis Know, understand diversity and sustainability Understand complexity and interdependence Manage complexity, uncertainty and risk Cross/Inter/Transdisciplinary understandings Integrate knowledge about environmental, social, political and economic systems Advocacy, lobbying Search out knowledge, inquire, investigate Learning how to learn Separate number, quantity, quality, value Data and information organisation, and interpretation Question formulating Consider consequences of applying scientific and technological innovations	Engage in active learning Move from awareness and knowledge to action Apply sustainability knowledge, understandings and skills Active, practical, civic participation and action Active participation in the community Ethical responsible citizen in democratic society Change personal lifestyles for sustainable futures Plan, manage, and participate in change Ability to adapt to change Creating positive change and societal transformation Take appropriate action to maintain, enhance, care, protect, preserve, conserve, restore environments Literacy, oral, written and graphic communication, using ICTs Use the language of sustainable development Articulate, assert, listen, express opinions, and refuse Engage in open dialogue and debate Explore the environment with the senses Observe, record information, ideas and feelings Copy, experiment, learn from mistakes Life and work skills Lifelong learning skills

Learning to be skills	Learning to live together skills
Accept change and acknowledge uncertainty Reflective Recognise and value diversity Respect difference Valuing, choosing sustainability attitudes and values Reflect on, comprehend, negotiate, change beliefs, perceptions, ethical principles, values Ethical responsible citizen and decision making Empathy, compassion towards others Imagining, visioning sustainable futures Develop a positive vision for their future Aesthetic response to the environment Ability to adapt to change Self-management, manage emotions and stress Self-efficacy, empowerment, internal locus of control Life skills, learning from mistakes Consider social justice issues Act with moral autonomy for justice, equity and sustainability Connected, engaged, interested, enthusiastic Communicate clearly, confidently Life skills for living sustainably Motivated, autonomous, self-directed learners	Build networks, partnerships, relationships Work in partnership with others Networking, connecting, exchange, interaction Work together, cooperate, teamwork Negotiate consensus, manage and resolve conflicts Skills for peace Interpersonal psycho-social skills Empathy, compassion towards others Recognise and value diversity Respect difference Interpersonal communication Advocate for others

From:

Unesco IIS. 2004. *International Implementation Scheme for the UN Decade of Education for Sustainable Development.* Paris: Unesco.

McKeown, R. 2002. *Education for Sustainable Development (ESD) Toolkit.* (p. 20)

McKeown, R. 2005. *Quality Education for Sustainable Development.* (pp. 5-6)

DEH. 2005. *Educating for a Sustainable Future.* Melbourne. (pp. 9-10, and pp. 18-19)

Commonwealth of Australia. 2009a. *Living Sustainably*. Canberra. DEWHA. (p. 9)

Commonwealth of Australia. 2010. *Sustainability Curriculum Framework. A guide for curriculum developers and policy makers*. Canberra. DEEWR. (pp. 9-10).

APPENDIX 36

Referred to in Chapter 8, Volume 1

A paradigm shift for education in moving towards ESD in the Asia Pacific region

NOTE:
This appendix is included on page 59 of the print copy
of the thesis held in the University of Adelaide Library.

From:

Unesco Bangkok. 2005b. *A Situational Analysis of Education for Sustainable Development in the Asia Pacific Region.* Bangkok, Thailand: Unesco Asia and Pacific Regional Bureau for Education. (p. 60)

APPENDIX 37

Referred to in Chapter 8, Volume 1

Characteristics appropriate for ESD in the 2005
National Environmental Education Statement for Australian Schools

Experiential, 'hands-on', 'learning by doing' that is highly interactive within and beyond the classroom.

Constructing knowledge, skills and values from direct experience in personally relevant contexts.

Involving feedback, reflection, critical analysis, applying ideas and skills to new situations.

Student-centred learning that is negotiated with students.

Values clarification and analysis of thoughts, feelings and diverse perspectives.

Explore concepts of spirituality, sacredness of place and stewardship of resources.

Creative, divergent, multidimensional thinking to develop a vision, and generate possibilities for a sustainable future.

Future problem solving, analysing environmental problems and deciding on solutions from a futures perspective.

Inquiry-based learning to investigate, analyse, solve problems, reach conclusions, make decisions, and appropriately act upon environmental concerns.

Explore environmental education for sustainability concepts, attitudes and skills through story telling.

From:

DEH. 2005. *Educating for a Sustainable Future. The National Environmental Education Statement for Australian Schools*. Melbourne: Curriculum Corporation. (pp. 20-21)

APPENDIX 38

Referred to in Chapter 8, Volume 1

Characteristics appropriate for ESD in Australia's 2009
National Action Plan for Education for Sustainability

From:

Commonwealth of Australia. 2009a. *Living Sustainably. The Australian Government's National Action Plan for Education for Sustainability.* Canberra: DEWHA. (p. 9)

APPENDIX 39

Referred to in Chapter 8, Volume 1

Transitions needed to move from traditional to contemporary
quality education approaches appropriate for ESD

FROM	TO
teaching	modelling, co-learning, action learning;
specific period	continuous, lifelong learning;
top-down control	democratic, participative decision making;
indoctrinating	empowering, self-expression, self-directed autonomous learning;
generic concerns	contextual local issues linked to related global concerns;
information acquisition	critical, long-term, creative, systems thinking applied to innovative problem solving and knowledge creation;
cognitive learning	active whole person learning;
single discipline	multidisciplinary, interdisciplinary, trans-disciplinary, integrated, holistic;
reforming	transforming and transformative;
classroom-based	include experiential learning in whole school, community, environment;
theoretical learning	include active, interactive, practical learning for action;
values free	values-based, rights-based;
individual learning	cooperative, team-based and social learning;
discriminatory, exclusive	inclusive, diverse, non-discriminatory, sensitive to gender and diversity;
limited methods	multi-method, multi-sourced, innovative, use of ICTs;
objective, impersonal	personal, relevant, based on positive relationships in conducive learning environments that model ESD values and principles;
fearful, punitive	fear-free, welcoming, safe, supportive learning environments.

From:
UNESCO IIS. 2004. *International Implementation Scheme for the UN Decade of Education for Sustainable Development.* Paris: Unesco.
DEST. 2005. *National Framework for Values Education in Australian Schools.* Canberra: DEST.
Commonwealth of Australia. 2006 and 2008. *VEGPSP Stages 1 and 2.* Melbourne: Curriculum Corporation.
DEH. 2005. *Educating for a Sustainable Future. The National Environmental Education Statement for Australian Schools.* Melbourne: Curriculum Corporation.
Commonwealth of Australia. 2009a. *The Australian Government's National Action Plan for Education for Sustainability.* Canberra: DEWHA.
Curriculum Corporation. 2008. *Global Perspectives. A Framework for Global Education in Australian Schools.* Melbourne: Curriculum Corporation.
Unesco Dakar. 2000. *The Dakar Framework for Action. Education For All*. Paris: Unesco.
OHCHR. 2006. *Plan of Action. World Programme for Human Rights Education (WPHRE), 2005-2007.*
Pigozzi, M. J. 2004. *The Ministerial Viewpoint on Quality Education*. Geneva: IBE.
Unesco EFA. 2005. *EFA Global Monitoring Report. Understanding Education Quality.* Paris: Unesco.
Unesco Bangkok. 2005b. *A Situational Analysis of ESD in the Asia-Pacific Region*. Bangkok: Unesco.

APPENDIX 40

Referred to in Chapters 8, 9, 13 and 14, Volume 1

Evaluative Criteria for values-based Education for Sustainable Development

Values-based	Global values for ESD are integrated explicitly across the curriculum and modelled throughout the school, in positive relationships, and values-based learning environments. Learning is values-driven, involving a range of methods to explore diverse values, feelings and perspectives, values conflicts, moral reasoning, values clarification, and ethical dilemmas, for an ongoing process of values internalisation, so learners have the skills to continue evolving their values throughout life.
Whole school approach	Modelling values and sustainable practices across the whole school community, also involving participation in, and cooperative partnerships with the local community and with relevant external organizations.
Whole person lifelong learning	Whole person learning involves cognitive, active or physical, socio-emotional and spiritual learning, engaging the head, heart, hand, and spirit, while developing ICT, communication and life skills, positive self-esteem, and the tools to continue learning throughout life.
Transformative	Learning transforms individual values, attitudes, behaviours, and lifestyles, and also transforms education and school contexts, while building skills for practical action for change, enabling learners to bring about personal and societal transformation for a sustainable future and collective well-being.
Experiential	Learners participate actively in practical, hands-on learning, applying knowledge, skills and values for sustainability, in and out of the classroom and in community.
Civic responsibility	Learners are informed and empowered to contribute to positive societal, environmental and/or civic action as responsible local and global citizens.
Participative	Learning is participative, interactive, democratic, empowering, cooperative, and team-based, enabling student voice, and engaging learners in designing the learning and in democratic process of decision making and conflict resolution.
Relevant, contextual	Learning is personally and locally relevant, linked to local contextual issues and related to global concerns.
Learner-centred	Learning is age-appropriate, individually-suited to accommodate learner needs and differences, inclusive, authentic, empowering, self-directed, democratic and negotiated (i.e. learners contribute to and participate in the learning design), and fosters skills for autonomous, lifelong learning.
Integrated Multidimensional Trans-disciplinary	Learning content covers all ESD dimensions (i.e. socio-political, cultural, economic, environmental), requiring holistic and systems approaches for inter/multidisciplinary, trans-disciplinary understandings integrated across the curriculum.
Inquiry-based	Investigating and analysing theoretical or real-life problems, issues and scenarios, involving creative, divergent, innovative, critical, reflective and systems thinking, and critical and media literacies, for complex problem solving and decision making.
Futures perspectives	Engaging in long-term futures thinking to envision possibilities and solutions for a sustainable future, choosing from a range of alternatives.
Positive learning environments	Learning environments are positive, welcoming, inclusive, equitable, non-discriminatory, sensitive to gender and all forms of diversity, child-friendly, safe, secure, trustful, supportive, modelling the values, fostering positive relationships, and encouraging socio-emotional development.
Multi-method, multi-sourced, quality learning	Using a variety of innovative pedagogies, teaching modes and methods, both in and outside the classroom and school, learning from others (e.g. including from community, Indigenous representatives, story telling, use of ICTs).

From:
(UNESCO IIS, 2004); (DEST, 2005); (Commonwealth of Australia, 2006, 2008, 2009a); (DEH, 2005); (Curriculum Corporation, 2008); (Unesco Dakar, 2000); (OHCHR, 2006); (Pigozzi, 2004); (Unesco EFA, 2005); (Unesco Bangkok, 2005b).

APPENDIX 41

Referred to in Chapter 9, Volume 1

Examples of references to diverse cultures in the Australian National Curriculum
(excluding specific references to ATSI and Asian cultures)

Strand and Topic	Year level	Content examples from learning areas
English (54)		
Language variation and change	F	English is one of many languages spoken in Australia and different languages may be spoken by family, classmates and community
Literature and context	F	Engage with texts that reflect the social and cultural groups to which students belong
Examining literature	F	Identify features of culture related to characters and events in literary texts (e.g. dress, food and daily routines) Replicate the rhythms and sound patterns in stories, rhymes, songs and poems from a range of cultures. Recognise cultural patterns of storytelling
Interacting with others	F	Show understanding of appropriate listening behaviour, such as listening without interrupting, and looking at the speaker if culturally appropriate
Texts in context	1	Respond to texts drawn from a range of cultures and experiences
Interacting with others	1	Learning to value listening, questioning and positive body language since different cultures may approach these differently
Language variation and change	2	The use of different modes of communication varies according to the audience, purpose, context and cultural background Recognise some phrases in the languages of the class and community, e.g. greetings and expressions of politeness
Language for interaction		Explore culturally specific greetings and expressions of politeness
Literature and context	2	Discuss moral and teaching stories from varied cultures, identifying and comparing their central messages
Responding to literature	2	Describe features of texts from different cultures e.g. recurring language patterns, style of illustrations, humour, drama
Examining literature	2	Compare the same story from different cultures, describing similarities and differences in points of view Explore poems, chants, rhymes or songs from different cultures, which class members may bring from home Recite, sing or create interpretations of poems, chants, rhymes or songs from students' own and other different cultures
Texts in context	2	Compare two or more versions of the same topic by different authors or cultures, describing similarities and differences
Language variation and change	3	A word or sign can carry different weight in different cultural contexts, e.g. that respect is due to some people and creatures and that stories can be passed on to teach us how to live appropriately
Expressing and developing ideas	3	Language expressing a range of feelings and positions, and judgments about characters or events, might differ depending on the cultural context
Creating literature	3	Create imaginative texts based on characters, settings and events from students' own and other cultures using visual features
Interpreting, analysing, evaluating	3	Read text types from a student's culture to enhance confidence in building reading strategies
Language variation and change	4	Identify commonly used words derived from other cultures
Language for interaction	4	How age, status, expertise, familiarity influence how we interact with people, and how these conventions vary across cultures
Literature and context	4	Compare fables and allegories from different cultures
Language variation and change	5	Explore words from a range of cultures in which pronunciation, writing and meaning has changed over time
Language for interaction	5	Cultures differ in making and responding to common requests (e.g. periods of silence, degrees of formality)
Literature and context	5	Identify aspects of literary texts that convey details or information about particular social, cultural and historical contexts Visuals, symbolic elements, dialogue and character descriptions can convey information about cultural elements, such as beliefs, traditions and customs

Strand and Topic	Year level	Content examples from learning areas
English		
Literature and context	6	Make connections between students' own experiences and those of characters and events represented in texts drawn from different historical, socio-cultural contexts Different historical, social and cultural experiences influence the meaning made from the text and the attitudes developed towards characters, actions and events
Interacting with others	6	How cultural experiences can affect responses to opinions
Literature and context	7	Explore ideas and viewpoints about events, issues and characters represented in texts drawn from different cultural contexts Identify aspects of texts that convey details of information about a particular culture (e.g. words, phrases, circumstances, facts) Explain different culture, gender or age perspectives in texts
Literature and context	8	How ideas and viewpoints in literary texts drawn from different historical, social and cultural contexts may reflect or challenge values Compare attitudes and ideas in texts drawn from contexts different to own How individual interpretations of texts are influenced by students' own knowledge, values and cultural assumptions
Responding to literature	8	Recognise and explain differing viewpoints about the world, cultures, individual people and concerns represented in texts
Language for interaction	9	Identify communities to which students belong and how language reinforces membership of these e.g. commonalities in migrant and cultural groups
Literature and context	9	Representations of people and culture in literary texts drawn from different historical, social and cultural contexts. Explore and reflect on representations of values and on personal understanding of the world and human experience, in literature drawn from cultures and times different from own
Responding to literature	9	How context has shaped the representation of particular cultures, e.g. the analysis of differing viewpoints in texts about different cultures from different periods (e.g. the portrayal of migrants in traditional and contemporary literature)
Texts in context	9	How the construction and interpretation of texts, including media texts, can be influenced by cultural perspectives
Literature and context	10	Compare a range of representations of individuals and groups in different historical, social and cultural contexts. Reflect on personal understanding of the world and human experience gained from interpreting literature drawn from cultures and times different from the students' own
Texts in context	10	How people or cultures are represented in texts, including media texts, through language, structural and/or visual choices Consider the similarities and differences between ethical positions across more than one culture as represented in text Question the representation of stereotypes of people or cultures Identify satirical events in other cultures e.g. political cartoons Poetic lyrical language in depicting people or culture in texts
Interacting with others	10	Explain reasons for stereotypes of people/cultures Identify satirical events in other cultures e.g. political cartoons Poetic lyrical language in depicting people/culture in texts
Interpreting, analysing, evaluating	10	Identify the meaning of subtle vocabulary and the different connotations of words in advertising texts from other cultures
History (13) *The social, cultural, economic and political development of civilisations or countries in history*		
Present and Past Family Life	1	How some cultures e.g. the Chinese, describe a child as being one year old on the day they are born
Present and Past Family Life	1	Events of personal significance (e.g. birthdays, moving house, changing schools, religious holidays) may differ according to children's cultural backgrounds
The Past in the present	2	Why an historical site of cultural or spiritual significance (e.g. community building, landmark, war memorial) has heritage significance or cultural value today
Community and remembrance	3	Identify the cultural groups within the local community and their influence over time (e.g. on architecture, commercial outlets, religious buildings) and compare the development of the local community with another community

Strand and Topic	Year	Content examples from learning areas
History		
Community and remembrance	3	Celebrations and commemorations in other places around the world e.g. Bastille Day in France, Independence Day in the USA and Greece, those observed in Australia e.g. Chinese New Year, Christmas Day, Diwali, Easter, Hanukkah, Moon Festival and Ramadan Origins and significance of international celebrations (e.g. International Day of Peace) important to particular cultural groups in Australia and other countries
First contacts	4	Examine impact of exploration on other societies, how these societies interacted with newcomers, and how these experiences contributed to their cultural diversity
Australia as a nation	6	Compare the cultural practices related to family life, beliefs and customs of newly-arrived migrant groups with those of the communities in which they settled within Australia Connect stories of migration to students' own family histories and examine the role of specific cultural groups in Australia's economic and social development (e.g. cattle industry, Snowy Mountains Scheme, pearling)
Analysis and use of sources	6	Movement of people to Australia in the 20th century and the increasing cultural diversity of present day Australia
The Globalising World	10	Developments in popular culture in postwar Australia and their impact on society e.g. introduction of television, and American and Asian cultural influence on Australian popular culture since World War II
Migration experiences	10	Multiculturalism policies since the 1970s and concepts of cultural heritage and assimilation. Post-World War II population growth and the development of Australia's culturally diverse society
Science (7)		
Earth and space sciences	F	Link the changes in the daily weather to the way we modify our behaviour and dress for different conditions, including examples from different cultures
Physical sciences	2	Toys from different cultures that use the forces of push or pull
Use and influence of science	2	How different cultures have made inks, pigments and paints by mixing materials
Nature and development of Science	5	Important contributions to the advancement of science have been made by people from a range of cultures How scientists from a range of cultures have improved our understanding of the solar system, such as Copernicus, Khayyám and Galileo
Nature and development of Science	6	Important contributions to the advancement of science have been made by people from a range of cultures How people from different cultures have used sustainable sources of energy, e.g. water and solar power **(S)**
Mathematics (8)		
Number and place value	F	Read stories from other cultures featuring counting in sequence to assist students to recognise ways of counting in local languages and across cultures Recognise that other cultures count in a variety of ways Use objects that are personally and culturally relevant to students
Number and place value	1	Reading stories from other cultures featuring counting in sequence to recognise counting in local languages and across cultures who count in a variety of ways
Using units of measurement	2	Use calendars to locate specific information, such as finding a given date on a calendar and saying what day it is, and identifying culturally specific days
Money and financial mathematics	4	Do calculations in another currency
Chance	6	Investigate games of chance popular in different cultures and evaluate the relative benefits to the organisers and participants (e.g. Pachinko)
Data representation and interpretation	8	Investigate an international issue where media reporting and the use of data reflects different cultural or social emphases (e.g. whaling, football World Cup)
Note: (S) Denotes example relating to sustainability		

From:
English, History, Science, and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d and 2010e).

APPENDIX 42

Referred to in Chapter 9, Volume 1

Examples of references to ATSI histories and cultures in the Australian National Curriculum

Strand and Topic	Year	Content examples from learning areas
English (24)		
Language variation and change	F	There are many languages spoken in Australia, including ATSI languages
Language variation and change	2	Identify different kinds of spoken, non-verbal, written and visual communication from ATSI communities
Literature and context	F	There are storytellers in all cultures including ATSI
Literature and context	1	How spiritual beings are represented in ATSI stories
Literature and context	2	Explore iconography of ATSI cultures
Examining literature	1	Explore poetry, chants and songs from ATSI cultures
Examining literature	2	Investigate ATSI stories that explain physical landscape features
Creating literature	1	Create visual representations of literary texts from ATSI cultures
Texts in context	1	Discuss the deeper meanings embedded in teaching and dreaming stories
Texts in context	2	Identify different kinds of spoken, non-verbal, written and visual communication from ATSI cultures
Interpreting, analysing, evaluating	F	Recognise the cyclical nature of events in ATSI stories
Language variation and change	4	Identify words used in Standard Australian English derived from ATSI languages
Language variation and change	6	There are more than 150 ATSI languages in Australia
Literature and context	3	Reading texts where ATSI children are central characters and make links to own lives noting similarities
Literature and context	5	Identify differences in setting and lifestyle between urban and remote ATSI peoples
Responding to literature	3	Draw on ATSI literature to explore common experiences and ideas, and differences in lifestyle and worldview
Examining literature	5	Examine the narrative voice in texts from ATSI traditions, which include perspectives of animals and spirits, and how we should care for the Earth (S)
Creating literature	3	Create visual and multimodal texts based on ATSI literature
Literature and context	7	Build knowledge, understanding and skills in relation to the history culture, and literary heritage of ATSI peoples
Literature and context	8	Explain different viewpoints in ATSI history texts
Literature and context	8	Examine interconnectedness of Country and Place, People, Identity and Culture in texts by ATSI authors
Literature and context	9	Analyse literature texts created by and about ATSI peoples
Examining literature	7	Analyse writers' depictions of challenges in texts eg faced by ATSI people
Texts in context	9/10	Compare perspectives on ATSI issues reported in commercial media compared to public and ATSI media
History (44)		
Personal and family histories	F	ATSI family structures (e.g. specific roles and responsibilities to ensure safety and wellbeing in extended families) ATSI oral traditions, painting and music - the past is communicated through stories passed down from generation to generation
Present and past family life	1	Kinship an important part of relationships and family structures in ATSI societies (e.g. how kinship systems influence relationships, obligations and behaviour towards each other). ATSI seasonal calendars
The past in the present	2	Visit local sites, places and landscapes of significance to ATSI people (e.g. engraving sites, rock paintings, natural sites, creeks or mountains) Traditional toys used by ATSI children to play and learn
Analysis and use of sources	2	Discover the origin and meaning of place and street names in local community (e.g. names linked to ATSI people, such as Eurobodalla National Park, historical events such as Deadman's Creek, early settlers, and political, religious and social figures)

Strand and Topic	Year	Content examples from learning areas
History		
Community and remembrance	3	The importance of Country and Place to ATSI peoples who belong to a local area Language groups of ATSI peoples who belong to the local area, and explain the relationship between language, country, place and spirituality. (S) Listen to ATSI Elders, grandparents and older community members tell stories associated with the local language groups and the land they belong to Symbolism of flags (e.g. the Australian and ATSI flags) and special occasions when they are flown (e.g. NAIDOC and National Reconciliation Week, Sorry Day)
Perspectives and interpretations	3	Meaning of celebrations from different perspectives (e.g. Australia Day for ATSI peoples compared with Anglo-Australians)
First contact*	4	The diversity and longevity of Australia's first peoples and how they are connected to Country and Place and the implications for their daily lives (S) Early archaeological sites (e.g. Nauwalabila, Malakunanja, Devil's Lair, Lake Mungo, Preminghana) that show the longevity of the Aboriginal people Diversity of ATSI language groups with emphasis on local area/state/territory Pre-contact ways of life of the ATSI peoples - knowledge of their environment including land management practices; sense of interconnectedness of Country /Place, People, Culture and Identity, and some of their principles (such as caring for country, caring for each other and respecting all things) (S) Studying totems in the lives of ATSI Peoples and the differences between them The nature of contact between ATSI and others, e.g. the Macassans and the Europeans, and the effects of these interactions on families and the environment (S) Contact with ATSI peoples before 1788 (e.g. the repulsion of the Dutch at Cape Keerweer in 1606 and the trade between the Macassans and the Yolngu people) European concept of land ownership compared with the ATSI peoples' relationship with the land and sea, and how this affected relations between them (S) Early contact history with the British (e.g. Pemulwuy or the Black War) and the impact of British colonisation on Aboriginal people (dispossession, dislocation and the loss of lives through conflict, disease, loss of food sources and medicines) (S) Positive or negative effects of interactions between Europeans and ATSI people (S)
Chronology, terms and concepts	4	The origins of Aboriginal place names in Australia.
Historical questions and research	4	Diversity and antiquity of ATSI peoples, and the nature of contact in early Australia
Perspectives and interpretations	4	Thoughts or feelings of the people in stories about contact experiences and early penal life (e.g. convicts, ATSI people, convict guards, free settlers)
The Australian colonies	5	What colonial life was like at that time for different inhabitants (e.g. a European family and an ATSI person, convict, free settler, sugar cane farmer, indentured labourer) in terms of clothing, diet, leisure, paid and unpaid work, language, housing and household chores The role that a significant ATSI individual or group played in shaping a colony
Australia as a Nation	6	Experiences of Australian democracy and citizenship, including the status and rights of ATSI peoples, migrants, and women Experiences of democracy and citizenship of ATSI people (e.g. policies and laws such as protection, removal of children from families, pay, working conditions) Stories of individuals or groups who advocated or fought for rights in 20th century Australia (e.g. Jack Patten or the Aborigines Progressive Association) The contribution of ATSI individuals and groups, to the development of Australian society, in areas such as the economy, education, science, the arts, sport Consider notable ATSI individuals in Australian public life across a range of fields (e.g. the arts, science, sport, education) drawn from Australian Living Treasures or the Australian Dictionary of Biography
Historical questions and research	6	The birth of Australian democracy and the experiences of citizenship for women, migrants and ATSI people
Analysis and use of sources	6	Find historical information in primary and secondary sources related to the rights and status of ATSI peoples
Movement of peoples (1750–1901)	9	Impact of arrivals on the ATSI peoples of the region (S)
Making a nation	9	The extension of settlement and the effects of contact (intended and unintended) between European settlers in Australia on ATSI peoples (S)
World War I	9	The experiences of ATSI peoples during the war
Overview	10	Major ATSI movements for rights and freedom

Strand and Topic	Year	Content examples from learning areas
History		
Rights and freedoms	10	Background to the struggle of ATSI peoples for rights and freedoms before 1965, including the 1938 Day of Mourning and the Stolen Generations
		Past experiences of ATSI peoples who were forcibly removed from their families
		How Freedom Rides in the US inspired civil rights campaigners in Australia, and how they became a turning point in ATSI struggle for rights and freedoms
		The significance of the following for the civil rights of ATSI peoples: 1962 right to vote; 1967 Referendum; Reconciliation; Mabo decision; Bringing Them Home Report (the Stolen Generations), the Apology
		The aims, tactics and outcomes of a particular event in the ATSI peoples' struggle for rights and freedoms
		Methods used by civil rights activists to achieve change for ATSI peoples, and the role of ONE individual or group in the struggle (e.g. Charles Perkins 1965 Freedom Ride)
		The efficacy of television in bringing struggle for rights/freedoms to national attention
		The continuing nature of efforts to secure civil rights and freedoms for ATSI peoples in Australia, in areas such as education, health, work
Science (12)		
Earth and Space sciences	F	How Aboriginal and Torres Strait Islander concepts of time and weather patterns explain how things happen in the world around them
Use and influence of science	1	Technologies used by ATSI people require an understanding of how materials are used to make tools, weapons, musical instruments, clothing, cosmetics, art
Use and influence of science	2	How ATSI people use science to meet their needs, including food supply
Nature and development of science	3	How knowledge of astronomy has been used by some ATSI people
Use and influence of science	3	ATSI people's knowledge of the local natural environment, such as the characteristics of plants and animals
Nature and development of science	4	How scientific practices such as sorting, classification and estimation are used by ATSI people in everyday life
Nature and development of science	5	How ATSI people used observation of the night sky to assist with navigation
Nature and development of science	6	How ATSI knowledge, such as the medicinal and nutritional properties of Australian plants, is being used as an evidence base for scientific advances
Biological sciences	7	Examples of human activity, such as the use of fire by traditional ATSI people
Nature and development of science	7	How land management practices of ATSI peoples can help inform sustainable management of the environment (S)
Use and influence of science	7	How ATSI knowledge is used to inform scientific decisions - care of waterways (S)
Use and influence of science	8	How Aboriginal people recognise relationships in ecosystems by burning to promote new growth, attract animals and for easier hunting and food gathering (S)
Mathematics (8)		
Number and place value	F	Use ATSI methods of adding/subtracting, spatial patterns and reasoning
Number and algebra	2	Using models such as linking blocks, sticks in bundles, place-value blocks and Aboriginal bead strings and explaining reasoning
Using units of measurement	2	Investigate the seasons used by Aboriginal people and compare them to those used in Western society
Location and transformation	3	Identify symmetry in Aboriginal rock carvings or art
Location and transformation	4	Use stimulus materials to create symmetrical patterns, pictures and shapes, such as the motifs in Central and Western Desert art
Using units of measurement	5	Investigate the ways time was and is measured in different Aboriginal Country, such as using tidal change
Data representation and interpretation	10	Use parallel box plots to compare data about the distribution of ATSI people by age with that of the Australian population as a whole
		Evaluate statistical reports comparing the life expectancy of ATSI people with that of the Australian population as a whole (S)

Note: (S) Denotes examples relating to sustainability

From:
English, History, Science, and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d and 2010e).

APPENDIX 43

Referred to in Chapter 9, Volume 1

Examples of references to Asia and Australia's engagement with Asia in the Australian National Curriculum

A/B	Strand and Topic	Year level	Content examples from learning areas
English (17)			
A	Text structure and organisation	F	Some features of print eg directionality of Japanese and Chinese texts
A	Literature and context	1	Similarities between texts from different cultural traditions e.g. representations of dragons in traditional European and Asian texts
A A	Examining literature	1	Performance poetry, chants and songs from ATSI peoples and Asian cultures Listen to and perform simple *haiku* poems about familiar topics
A	Creating literature	1	Create visual representations of literary texts from ATSI or Asian cultures
B	Language variation and change *and* Texts in context	2	Features of spoken, non-verbal, written and visual communication from Asian cultures in Australia, associated with particular communities
A	Literature and context	3	How the same story can be told in many cultures with variations in the storyline and music (e.g. 'The Ramayana' story in India, Indonesia, Thailand, Cambodia, Burma, Laos, Tibet, Malaysia)
B	Responding to literature	3	Explore commonalities of experience and ideas drawing on literature from ATSI or Asian cultures
B	Creating literature	3	Create visual and multimodal texts based on ATSI or Asian literature
A	Texts in context	6	Analysis of the ways images and words combine for deliberate effect in display advertising from the countries of Asia (e.g. Indian Bollywood film posters)
B	Language variation and change	7	Explore languages and dialects through building webcam relationships with schools across Australia and Asia
A	Examining literature	7	Discuss the engaging features of traditional stories from Asia (e.g. use of oral mode, visual elements, verse, use of puppets) to convey the narrative
A	Language variation and change	8	Influence of English language on other languages (e.g. Singlish in Singapore)
A A	Literature and context	9	Review historical fiction or nonfiction written by and about the peoples of Asia Analyse literary texts/film produced by and about peoples of Asian background, considering the different ways these texts represent people, places, things, issues
B	Interpreting, Analysing and Evaluating	9	How and why issues are debated and reported in the media in different countries e.g. 'whaling' in Japan and Australia
A	Creating texts	10	Explore models of sustained texts created for persuasive purposes about a challenging or complex issue from other cultures, including Asia
History (22)			
B	Personal and Family Histories	F	Use images and stories to identify similarities and differences between students' families and those of other children (e.g. the countries of Asia)
A	First contact	4	Identify key individuals and groups who established contacts with Africa, the Americas, Asia and Oceania during the age of discovery
B	The Australian colonies	5	The reasons people migrated to Australia from Europe and Asia
B	Australia as a Nation	6	Stories of groups of people who migrated to Australia (including from ONE Asian country) and the reasons they migrated
A	Ancient Rome	7	Contacts between Rome and Asian societies in the period
A	The Asian World	7	Whole topic on the *(Ancient)* Asian World with a focus on China, India
A	The Asia Pacific World 700 - 1860	8	**Whole topic on the history Asia Pacific World** (i.e. Angkor/Khmer Empire or Shogunate Japan or the Polynesian expansion across the Pacific)

A/B	Strand and Topic	Year level	Content examples from learning areas
History			
A A A	Expanding contacts	8	Map the expansion of the Mongol empire across Asia and Europe The role of the Mongols in forging connections between Europe and Asia The role of expanding trade between Europe and Asia in the Black Death and mapping the spread of the Black Death (Asia, Africa, Europe) and its effects on their populations
A A A	The making of the modern world	9	The extent of European imperial expansion and different responses, including in the Asian region How Asian societies responded to European imperialism, the extent to which they were changed by it and the influence they exercised on the rest of the world Asian societies that were colonised by Europeans and those that remained independent
A	Australia and Asia 1750–1918	9	The history of Australia OR an Asian society for the period
B B	Making a nation	9	The experiences of non-Europeans in Australia prior to the 1900s (Japanese, Chinese) The migration of Chinese to the goldfields in Australia in the 19th century and attitudes towards the Chinese as revealed in cartoons
A	Asia and the World 1750–1918		**An entire elective topic on Asia and the World** (with no reference to Australia)
A	Overview	10	The rising influence of Asian nations since end of the Cold War
A B	World War II	10	Key events in the Asia-Pacific theatre of war (e.g. Japanese attack on Pearl Harbour and the fall of Singapore in 1942) The significance of World War II to Australia's international relationships in the twentieth century, with reference to Asia
B	The Globalising World	10	Asian influences on Australian popular culture since World War II (e.g. Bollywood)
B	Migration experiences	10	The waves and trends of migration since World War II, such from Asian source countries, and the numbers of migrants from those and other countries
Science (4)			
A	Earth and Space Sciences	4	Effect of events such as floods and extreme weather on the landscape, both in Australia and in the Asia region
A	Earth and Space Sciences	6	Major geological events such as earthquakes, volcanic eruptions and tsunamis in Australia, the Asia region and throughout the world
A	Biological Sciences	7	Examples of human activity, such as the effects of palm oil harvesting in Sumatra and Borneo
A	Use and Influence of Science	8	The role of science in the development of technology important to the economies and communities of the Asia–Pacific regions, for example car manufacture, earthquake prediction and electronic optics
Mathematics (7)			
A	Number and place value	1	Play a traditional Korean counting game
B	Money, financial mathematics	1	Compare Asian coins to Australian coins
B	Location and transformation	4	Identify the scale used on maps of cities and rural areas in Australia and a city in Indonesia and describe the differences
A	Location and transformation	4	Use stimulus materials to create symmetrical patterns, pictures and shapes, such as the motifs in Central Asian textiles, Tibetan artefacts, Indian lotus designs and symmetry in Central and Western Desert art
A	Shape	6	Consider the history and significance of pyramids from a range of cultural perspectives including those structures found in China, Korea and Indonesia
B	Real numbers	8	Calculate population growth rates in Australia and Asia explain their difference
B	Using units of measurement	9	Identify regions in Australia and countries in Asia that are in the same time zone
Legend: A = Reference to Asia and Asian cultures B = references to Australia's engagement with Asia			

From: English, History, Science, and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d and 2010e).

APPENDIX 44

Referred to in Chapter 9, Volume 1

References in the Australian National Curriculum to the environmental practices of ATSI peoples, and their connection to, and interdependence with the land

Learning area	Year level	Curriculum content in the learning areas
Science	7	How land management practices of ATSI peoples can help inform sustainable management of the environment
	8	How Aboriginal people recognise relationships in ecosystems by burning to promote new growth, attract animals and for easier hunting and food gathering
English	5	Examine the narrative voice in texts from ATSI traditions, which include perspectives of animals and spirits, and how we should care for the Earth
	8	Examine interconnectedness of Country and Place, People, Identity and Culture in texts by ATSI authors
History	4	Pre-contact ways of life of the ATSI peoples ATSI knowledge of their environment and land management practices Sense of ATSI interconnectedness of Country and Place, People, Culture and Identity Awareness of ATSI principles (such as caring for country, caring for each other and respecting all things)

From:

History, Science and English learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c and 2010e).

APPENDIX 45

Referred to in Chapter 9, Volume 1

References in the Australian National Curriculum to the sustainability of practices used by other cultures

Learning area	Year level	Curriculum content in the learning areas
Science	6	How people from different cultures have used sustainable sources of energy (e.g. water and solar power)
	7	How human activity can affect local habitats and interactions between organisms, affecting food chains and food webs through: deforestation, agriculture (e.g. palm oil harvesting in Sumatra and Borneo)
History	8	Attempts by the Tokugawa Shogunate to curb deforestation (e.g. imposing heavy regulations on farmers; managing the harvesting of trees; and using new, lighter and more efficient construction techniques) The way Polynesian societies used environmental resources (sustainably and unsustainably) The extinction of the moa in New Zealand, the use of supernatural threats to conserve resources, and the exploitation of Easter Island's palm trees Genghis Khan's policies for governing his empire (e.g. banning the killing of animals in the breeding season)

From:

Science and History learning areas in the Australian National Curriculum (ACARA, 2010b, and 2010c).

APPENDIX 46

Referred to in Chapters 9 and 10, Volume 1

Definitions of 'Reasoning' and 'Problem Solving'
across year levels in the Australian National Mathematics Curriculum

Reasoning

Reasoning includes explaining comparisons of quantities, creating patterns, and explaining processes for indirect comparison of length. (Foundation Year – ACARA, 2010d, p. 14)

Reasoning includes explaining direct and indirect comparisons of length using uniform informal units, justifying representations of data, and explaining patterns that have been created. (Year 1 - ACARA, 2010d, p. 16)

Reasoning includes using known facts to derive strategies for unfamiliar calculations, comparing and contrasting related models of operations, describing connections between 2-D and 3-D representations, and creating and interpreting simple representations. (Year 2 - ACARA, 2010d, p. 18)

Reasoning includes using generalising from number properties and results of calculations, comparing angles, creating and interpreting variations in the results of data collections and data displays. (Y3 - ACARA, 2010d, p. 21)

Reasoning includes using generalising from number properties and results of calculations, deriving strategies for unfamiliar multiplication and division tasks, comparing angles, communicating information using graphical displays and evaluating the appropriateness of different displays. (Year 4 - ACARA, 2010d, p. 24)

Reasoning includes investigating strategies to perform calculations efficiently, creating financial plans, interpreting results of chance experiments and interpreting data sets. (Year 5 - ACARA, 2010d, p. 27)

Reasoning includes explaining mental strategies for performing calculations, describing results for continuing number sequences, investigating new situations using known properties of angles, explaining the transformation of one shape into another, and inferring from the results of experiments. (Year 6 - ACARA, 2010d, p. 30)

Reasoning includes applying the number laws to calculations, applying known geometric facts to draw conclusions about shapes, applying an understanding of ratio and interpreting data displays.
(Year 7 - ACARA, 2010d, p. 34)

Reasoning includes justifying the result of a calculation or estimation as reasonable, explaining formal and intuitive use of ratios for comparing rates and prices, deriving one probability from its complement, using congruence to deduce properties of triangles, and making inferences about data.
(Year 8 - ACARA, 2010d, p. 38)

Reasoning includes following mathematical arguments, evaluating media reports and using statistical knowledge to draw conclusions, developing strategies in investigating similarity and sketching linear graphs.
(Year 9 - ACARA, 2010d, p. 41)

Reasoning includes formulating geometric proofs involving congruence and similarity, interpreting and evaluating media statements and interpreting and comparing data sets. (Year 10/10A - ACARA, 2010d, p. 44)

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**Definitions of 'Reasoning' and 'Problem Solving'
across year levels in the Australian National Mathematics Curriculum**

Problem solving

Problem solving includes using materials to model authentic problems, sorting objects, using familiar counting sequences to solve unfamiliar problems, and discussing the reasonableness of the answer. (Foundation Year – ACARA, 2010d, p. 14)

Problem solving includes using materials to model authentic problems, giving and receiving directions to unfamiliar places, and using familiar counting sequences to solve unfamiliar problems. (Year 1 - ACARA, 2010d, p. 16)

Problem solving includes formulating problems from authentic situations, making models and using number sentences that represent problem situations, planning routes on maps, and matching transformations with their original shape. (Year 2 - ACARA, 2010d, p. 18)

Problem solving includes formulating and modelling authentic situations involving planning methods of data collection and representation, making models of three-dimensional objects and using number properties to continue number patterns. (Year 3 - ACARA, 2010d, p. 21)

Problem solving includes formulating, modelling and recording authentic situations involving operations, comparing large numbers and time durations, and using properties of numbers to continue patterns. (Year 4 - ACARA, 2010d, p. 24)

Problem solving includes formulating and solving authentic problems using numbers and measurements, creating transformations and identifying line and rotational symmetries. (Year 5 - ACARA, 2010d, p. 27)

Problem solving includes formulating and solving authentic problems using numbers and measurements, creating similar shapes through enlargements, representing secondary data, and calculating angles. (Year 6 - ACARA, 2010d, p. 30)

Problem solving includes formulating and solving authentic problems using numbers and measurements, creating transformations and identifying symmetry, calculating angles and interpreting sets of data collected through chance experiments. (Year 7 - ACARA, 2010d, p. 34)

Problem solving includes formulating and modelling, with comparisons of ratios, profit and loss, authentic situations involving areas and perimeters of common shapes and analysing and interpreting data using two-way tables. (Year 8 - ACARA, 2010d, p. 38)

Problem solving includes calculating surface areas and volumes of right prisms, applying ratio and scale factors to similar figures, solving problems involving right-angle trigonometry, and collecting data from secondary sources to investigate an issue. (Year 9 - ACARA, 2010d, p. 41)

Problem solving includes calculating the surface area and volume of a diverse range of prisms, finding unknown lengths and angles using applications of trigonometry, using algebraic and graphical techniques to find solutions to simultaneous equations and inequalities, and investigating independence of events and their probabilities. (Year 10/10A - ACARA, 2010d, p. 44)

From: Mathematics learning area in the Australian National Curriculum (ACARA, 2010d).

APPENDIX 47

Referred to in Chapters 10, 13 and 14, Volume 1

Frequency of skills in the Australian National Curriculum by groups of skills.

Thinking – identify (438), understand/comprehend (398), [1]creating (293), recognise (224), compare (181), develop ideas (166), evaluate/appraise/judge/assess (141), analyse (126), interpret (124), link/connect (124), consider (123), choose/select/decide (123), build/construct/reconstruct (101), apply (74), plan (60), predict (59), combine/incorporate/integrate/consolidate (58), improve/enhance/refine (57), edit/review/scan/ self-correct/revise (54), reason (53), expand/extend (52), draw on/from (49), infer/conclude/imply/deduce (43), justify/substantiate/prove/defend/claim (32), list/name/compile (31), differentiate/distinguish/discriminate (30), determine (29), outline (28), reflect (27), solve problems (21), think (20), formulate (18), simplify (17), summarise (17), contrast (16) conserve/preserve/protect (15), critical analysis/critique/challenge/disagree/refute (15), define/specify (15), trace/track/monitor (15), adapt (14), design (14), recall/remember (13), process (12), replicate/reproduce/copy/ imitate (12), change/transform (12), illustrate (11), generalise (10), map (9), synthesise (8), draft (6), substitute/replace (6) discover (5), visualise (5), abstract (4), adjust (4), elaborate (4), initiate (3), retrieve (3), simulate (3), brainstorm (2), navigate (2), self-monitor (2), attend to (1), detect (1), preview (1), symbolise (1)

Total: 3635

Communicating – describe (311), use ICTs (229), explain (161), discuss (141), read (110), represent (107), answer questions/respond (105), present (101), express/give opinion (98), ask/pose questions/interview/request/ question/interrogate (98), communicate (97), listen (86), write (86), speak/talk (71), engage/interact (58), inform/convey (46), share/exchange (45), argue/debate (45), record (43), spell (42), relate/retell/recount/narrate (40), participate/contribute (36), display (35), report (30), suggest/propose (30), cooperate/collaborate (30), demonstrate (27), influence/persuade (27), comment (23), clarify (21), note/annotate (13), appreciate (12), dramatise/role play (12), survey (12), acknowledge (11), publish (11), perform (10), rehearse (8), follow directions (8), recite (6), introduce (4), negotiate (4), position (4), repeat (4), paraphrase/rephrase (4), promote/advertise (3), feedback (3) prompt (3), affirm (1), consensus (1).

Total: 2512

Inquiring – investigate (299), explore (198), find/research (132), observe/view (119), inquire (72), experiment (69), examine (68), gather data/collect info (55), modelling (49), locate (49), test/trial (20), access information (7), search (7), hypothesise/speculate (7), use sources (2).

Total: 1145

Calculating - [2]sequence (299), add (57), calculate/estimate (53), graph (42), check/verify/confirm (40), subtract (33), measure (32), count (25), factorise (13), convert (9), plot (9), divide (7), multiply (7), assign (6), derive (6), solve number problems (108).

Total: 746

Grand Total: 8038 skill references (241 separate skills)

Notes:
1 **Creating** (232), innovate/invent (11), compose (15), draw/sketch (35)=(293) is included in *Thinking*
2 **Sequence** (128), order/reorder (45), group/regroup (28), organise (22) categorise/classify (24), sort (14) partition (18), match (13), rearrange (7) = (299) included in *Calculating*

From: English, History, Science and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d, and 2010e).

APPENDIX 48

Referred to in Chapter 10 Volume 1

Full collation of skills in the Australian National Curriculum

Learning areas → Year levels ↓	English		History		Science		Mathematics	
Foundation to Year 2	Access 2	Infer 3	Acknowledge 1	Identify 22	Access Info 2	Observe 40	Add 19	Identify 24
	Acknowledge 2	Initiate 2	Ask/posequestions 8	Inquire 5	Ask/pose questions 6	Organise 2	Answer questions 5	Interpret 7
	Add 6	Interact 7	Answer questions 1	Interpret 3	Analyse 3	Participate 2	Ask/posequestions 1	Investigate 6
	Adjust 2	Interpret 7	Analyse 3	Interview 1	Answer questions 2	Plan 3	Build 4	Justify 2
	Analyse 4	Invent 1	Annotate 1	Investigate 1	Combine 1	Predict 4	Calculate 1	Link 2
	Appreciate 2	Investigate 1	Appreciate 1	List 1	Communicate 8	Present (to) 2	Categorise 2	List 2
	Ask 14	Link 1	Build 1	Listen 2	Compare 10	Preserve 1	Check 1	Locate 3
	Answer 6	Listen 40	Comment 2	Locate 2	Conserve 1	Protect 1	Choose 2	Match 1
	Apply 1	Locate 2	Communicate 9	Model 1	Consider 6	Question 3	Classify 4	Measure 1
	Brainstorm 1	Map 2	Compare 13	Name 1	Describe 18	Recognise 10	Collect/gather 7	Model 8
	Build on 1	Match 5	Compose 1	Noting 1	Discuss 8	Record 3	Combine 1	Name 4
	Change 2	Monitor 5	Consider 2	Order 3	Draw 7	Represent 6	Communicate 3	Observe 3
	Check 7	Organise 1	Create 8	Present 1	Engage 1	Research 2	Compare 10	Order 13
	Choose 2	Paraphrase 1	Describe 10	Recall 1	Evaluate 2	Respond 3	Connect 13	Partition 7
	Clarify 2	Participate 10	Design 1	Recognise 5	Explore 23	Role play 3	Construct 1	Perform 3
	Combine 6	Perform 2	Develop 10	Relate 6	Find 3	Share 3	Contrast 1	Plan 1
	Comment 5	Plan 2	Discover 1	Report 1	Gather 2	Sort 5	Copy 1	Predict 2
	Communicate 11	Predict 8	Discuss 9	Represent 4	Graph 4	Suggest 4	Count 21	Read 3
	Compare 13	Present (to) 13	Distinguish 4	Research 3	Group 1	Test 2	Create 7	Rearrange 2
	Contrast 3	Prompt 1	Draw 4	Retell 1	Identify 16	Think 3	Decide 1	Reasoning 13
	Compose 2	Questioning 2	Engage 1	Search 1	Infer 1	Understand 8	Demonstrate 2	Recognise 18
	Confirm 1	Read 46	Examine 8	Sequence 8	Inquire 6	Use IT 2	Derive 1	Record 1
	Connect 13	Recall 2	Explain 6	Share 1	Investigate 4		Describe 35	Relate 1
	Consider 13	Reconstruct 1	Explore 10	Speak 1	Link 2		Determine 5	Report 1
	Construct 12	Recite 6	Find out 3	Suggest 2	Match 2		Develop 1	Represent 18
	Contrast 3	Recognise 36		Talk 3	Monitor 1		Discuss 1	Reproduce 1
	Contribute 5	Record 2		Understand 13			Display 9	Sequence 20
	Convey 2	Recount 3		Use IT 6			Divide 3	Share 2
	Create/creating 31	Rehearse 1		Use sources 1			Draw 7	Sketch 1
	Demonstrate 3	Relate 1		Write 2			Establish 1	Solve problems 11
	Describe 9	Remember 2					Experiment 1	Sort 6
	Design 1	Repeat 2					Explain 9	Subtract 13
	Develop 12	Replace 3					Explore 1	Survey 2
	Disagree 2	Replicate 1					Find 1	Trial 1
	Discover 1	Report 2					Follow directions 7	Understand 21
								continued

Learning areas → / Year levels ↓	English		History		Science		Mathematics	
Foundation to Year 2	Discuss 34 Display 1 Draw 7 Draw *on/from* 10 Edit 2 Engage 10 Evaluate 3 Examine 4 Exchange 1 Experiment 5 Explain 2 Explore 34 Express 18 Extend 9 Feedback (give) 1 Find 3 Formulate 1 Group 3 Identify 40 Imitate 1 Improve 3 Incorporate 1	Represent 5 Reproduce 1 Request 1 Respond 18 Retell 15 Review 1 Role Play 2 Select 7 Self-Correct 4 Sequence 14 Share 9 Solve problems 3 Speak 18 Spell 13 Summarise 1 Talk 14 Think 5 Understand 37 Use IT 3 View 12 Write 35					Formulate 1 Generalise 1 Group 4	Use IT 3 Visualise 1 Write 3
Years 3-6	Access 2 Acknowledge 4 Adapt 4 Add 5 Adjust 1 Affirm 1 Analyse 12 Answer 4 Apply 4 Appreciate 2 Ask/pose 13 Assess 1 Assign 1 Attend to 1 Build on 3 Change 4 Check 7 Choose 9	Interact 6 Introduce 1 Interpret 18 Interrogate 1 Introduce 1 Investigate 7 Judge 1 Justify 1 Link 13 Listen 25 Locate 1 Monitor 5 Navigate 2 Negotiate 2 Noticing 1 Noting 7 Observe 5 Opinion (give) 24	Analyse 7 Annotate 2 Ask/posequestions 8 Check 2 Combine 3 Communicate 13 Compare 15 Compile 1 Compose 7 Connect 2 Consider 1 Construct 2 Create 12 Describe 9 Determine 2 Develop 25 Discover 2 Discuss 4	Incorporate 4 Inform 3 Inquire 5 Interpret 3 Interview 1 Investigate 20 Link 1 List 2 Listen 1 Locate 12 Map 3 Noting 1 Organise 1 Present 9 Process 1 Recognise 1 Reconstruct 1 Record 8	Add 2 Apply 5 Ask/pose questions6 Analyse 4 Answer questions 4 Appreciate 4 Argue 4 Choose 2 Clarify 2 Classify 3 Collect 5 Communicate 17 Compare 16 Conclude 1 *(draw conclusions)* Conserve 2 Consider 29 Construct 5	Improve 9 Inform 5 Inquire 9 Investigate 33 Link 2 List 1 Match 4 Measure 11 Modeling 7 Observe 24 Order 1 Organise 3 Plan 9 Predict 17 Present 1 Quantify 1 Question 6 Recognise 15	Add 19 Apply 10 Appreciate 1 Ask/posequestions 3 Answer Questions 8 Build 5 Calculate 12 Categorise 1 Check 8 Choose 6 Classify 3 Collect/gather 9 Combine 4 Comment 3 Communicate 6 Compare 22 Connect 19 Consider 3	Identify 38 Illustrate 4 Infer 1 Inform 1 Interpret 24 Introduce 1 Investigate 26 Justify 2 List 2 Locate 8 Measure 14 Model 9 Multiply 5 Name 1 Observe 2 Order 15 Organise 1 Partition 10

Learning areas →	English		History		Science		Mathematics	
Year levels ↓								
Years 3-6	Clarify 10	Order 3	Dramatise 1	Recount 1	Debate 2	Record 7	Construct 11	Plan 6
	Collaborate 1	Organise 6	Draw *on/from* 1	Report 2	Decide 3	Reflect 4	Convert 8	Position 1
	Combine 10	Paraphrase 1	Edit 1	Represent 2	Define 1	Report 7	Convey 1	Predict 3
	Comment 8	Participate 8	Examine 17	Research 6	Demonstrate 4	Represent 10	Count 4	Present 3
	Communicate 6	Persuade 2	Exchange 1	Retrieve 1	Describe 30	Research 10	Create 22	Read 2
	Compare 17	Plan 15	Explain 15	Search 2	Develop 20	Respond 2	Critique 1	Rearrange 2
	Compose 2	Predict 4	Explore 7	Sequence 10	Discuss 15	Select 4	Decide 1	Reasoning 13
	Conclude 2	Present (to) 23	Find 8	Speak 1	Distinguish 1	Share 8	Define 1	Recall 7
	Confirm 3	Preservation (of	Graph 1	Survey 1	Draw 1	Solve problems 6	Demonstrate 5	Recognise 35
	Connect 21	natural heritage) 1	Identify 36	Talk 1	Draw on evidence 1	Sort 2	Derive 1	Record 6
	Consider 6	Prompt (to) 2	Illustrate 1	Think 1	Estimate 1	Suggest 11	Describe 39	Refine 1
	Construct 12	Publish 6		Understand 24	Evaluate 4	Survey 4	Design 1	Regroup 3
	Contrast 2	Questioning 3		Use IT 14	Experiment 3	Test 9	Determine 3	Relate 1
	Contribute 6	Read 37		Use sources 1	Explain 5	Think 2	Develop 5	Report 1
	Convey 10	Reasoning 1		Write 3	Explore 16	Understand 30	Discuss 1	Represent 30
	Cooperate 1	Recall 1			Find 9	Use IT 8	Display 15	Reproduce 3
	Create 47	Recognise 28			Gather 5		Distinguish 2	Select 2
	Creative 1	Record 2			Graph 9		Divide 3	Sequence 10
	Debate 1	Recount 4			Group 4		Draw 1	Share 1
	Decide 3	Reflect on 3			Identify 25		Enlarge 2	Simplify 1
	Define 1	Rehearse 3					Establish 1	Solve problems 35
	Demonstrate 4	Relate 1					Estimate 5	Subtract 18
	Describe 19	Repeat 2					Evaluate 4	Suggest 1
	Determine 2	Rephrase 1					Experiment 10	Survey 4
	Develop 25	Report 9					Explain 6	Test 1
	Differentiate 2	Request 2					Explore 14	Trial 1
	Discuss 25	Research 9					Extend 4	Understand 22
	Distinguish 2	Respond 14					Find 7	Use IT 25
	Draft 4	Retell 1					Formulate 4	Verify 2
	Draw *on/from* 12	Retrieve 1					Generalise 3	Visualise 2
	Edit 15	Review 4					Group 1	Write 7
	Elaborate 1	Revise 3						
	Engage 11	Role play 1						
	Enhance 3	Scan 2						
	Evaluate 17	Select 23						
	Examine 12	Self correct 5						
	Expand 6	Self monitor 2						
	Experiment 11	Sequence 24						
	Explain 17	Share 12						
	Explore 26	Solve problems 1						
	Express 18	Speak 13						

continued

APPENDIX 48 (continued)

Learning areas → / Year levels ↓	English		History		Science		Mathematics	
Years 3-6	Extend 13 Feedback 2 Find 5 Gather info 5 Group 10 Identify 48 Improve 2 Incorporate 3 Infer 3 Initiate 1 Innovate 2 Integrate 4	Specify 1 Speculate 3 Spell 21 Suggest 1 Summarise 7 Talk 2 Think 6 Track 2 Understand 61 Use IT 4 View 15 Visualise 1 Write 18						
Years 7-10	Abstraction 4 Acknowledge 1 Adapt 10 Add 4 Adjust 1 Analyse 53 Answer 2 Apply 6 Appraise 2 Appreciation 2 Argue (logically)10 Ask 3 Assess 6 Build on ideas 3 Challenge 3 Change 1 Check 1 Choose 7 Clarify 7 Collaborate 1 Combine 6 Comment 4 Communicate 2 Compare 34 Compile 1 Comprehend 1 Conclude/Draw conclusions 8	Imitate 1 Imply 1 Improve 4 Incorporate 1 Infer 3 Influence 17 Inform 8 Innovate 4 Integrate 2 Interact 9 Interpret 30 Interrogate 1 Investigate 11 Judge 2 Justify 6 List 3 Listen 17 Locate 1 Narrate 1 Negotiate 2 Observe 1 Opinion(give)14 Order 4 Organise 3 Outline 3 Participate 5 Perform 5 Persuade 8	Access IT info 1 Acknowledge 2 Advertise 1 Analyse 16 Answer Questions 5 Argue 8 Ask/posequestions 4 Brainstorm 1 Build 1 Categorise 2 Choice 1 Combine 1 Communicate 9 Compare 3 Compile 2 Compose 3 Conclude 8 (draw/ reach conclusions) Consider 2 Conserve heritage and environment 2 Consolidate 5 Construct 2 Contrast 1 Cooperate 1 Create 11 Debate 1 Define 4	Illustrate 1 Incorporate 5 Inform 6 Innovate 3 Inquire 33 Interpret 14 Investigate 60 Judge 1 Link 2 List 5 Listen 1 Locate 17 Map 4 Organise 3 Outline 24 Plan 6 Present 6 Preserve nat/cult 1 Protect (social) 2 Process 11 Read 1 Reasoning 1 Recognise 13 Record 6 Recount 2 Refine 2 Represent 5 Research 14	Access Info 2 Analyse 19+(2crit) Apply 9 Argue 4 Ask/pose questions 2 Assess 2 Calculate 3 Claim 10 (ie make, test, evaluate) Classify 6 Collaborate 7 Collect 9 Combine 4 Communicate 13 Compare 15 Conclude 5 (draw/ reach conclusions) Connect 3 Conserve 4 Consider 46 Construct 7 Convey 2 Critical analysis 2 Decide 2 Demonstrate 2 Describe 46 Design 4	Illustrate 1 Improve 19 Inform 2 Innovate 1 Inquire 14 Interpret 2 Investigate 67 Justify 2 Link 5 Locate 1 Measure 5 Modelling 23 Name 1 Observe 6 Organise 2 Outline 1 Plan 12 Predict 18 Present 11 Propose 2 Quantify 3 Question 6 Rearrange 2 Recognise 34 Record 7 Reflect 2 Relate 4 Report 2	Acknowledge 1 Add 2 Analyse 3 Ask/posequestions 2 Answer Questions 8 Apply 39 Argument/proof 3 Assign 5 Build 10 Calculate 26 Check 7 Choose 7 Classify 3 Collect/gather 11 Comment 1 Compare 13 Conclude 5 (draw conclusions) Connect 15 Consider 1 Construct 11 Convert 1 Create 7 Decide 3 Deduce 2 Define 6 Demonstrate 5 Derive 4	Generalise 4 Graph 15 Group 1 Identify 29 Illustrate 2 Improve 2 Interpret 16 Introduce 1 Investigate 63 Justify 3 List 4 Locate 2 Match 1 Measure 1 Model 1 Multiply 2 Observe 1 Order 5 Partition 1 Plan 1 Plot 9 Predict 2 Present 2 Prove 2 Read 1 Rearrange 1 Reasoning 21 Recognise 16

Learning areas → Year levels ↓	English		History		Science		Mathematics	
Years 7-10	Connect 9	Plan 5	Demonstrate 2	Respond 1	Develop 17	Represent 9	Design 2	Record 1
	Consensus (reach) 1	Position 3	Describe 58	Review 5	Discover 1	Research 20	Describe 35	Report 2
	Consider 14	Predict 1	Design 4	Search 4	Discuss 3	Respond 2	Determine 12	Represent 18
	Consolidate 1	Present (to) 30	Detect 1	Select 8	Distinguish 7	Review 2	Develop 6	Reproduce 2
	Construct 8	Preview 1	Determine 2	Sequence 8	Draw on 1	Select 6	Discuss 1	Select 2
	Contrast 9	Promote2	Develop 24	Suggest 2	Enhance 1	Sequence 1	Display 10	Sequence 1
	Convey 6	Publish 5	Differentiate 1	Synthesise 3	Estimate 1	Share 2	Distinguish 5	Simplify 14
	Create/creating 81	Questioning 1	Discuss 10	Think 2	Evaluate 20	Simplify 2	Divide 1	Sketch 7
	Creative 5	Read 20	Distinguish 3	Trace 2	Examine 4	Simulate 3	Draw 2	Solve problems 62
	Critical (thinking) 4	Reasoning 4	Draft 1	Understand 32	Experiment 13	Solve problems 8	Establish 11	Substitute 2
	Critique 2	Recognise 13	Draw *on/from* 2	Use IT 12	Explain 14	Sort 1	Estimate 4	Subtract 2
	Debate 12	Refine 6	Enhance 3		Explore 16	Suggest 7	Evaluate 15	Summarise 2
	Decide 1	Reflect on 18	Evaluate 10		Find 9	Summarise 2	Expand 6	Symbolise 1
	Defend 1	Refute 1	Examine 15		Formulate 3	Survey 1	Experiment 8	Think 1
	Define 1	Rehearse 4	Experiment 1		Gather 2	Test 5	Explain 9	Understand 57
	Describe 3	Reorder 1	Explain 63		Graph 10	Understand 37	Explore 11	Use IT 21
	Design 1	Rephrase 1	Explore 6		Group 1	Use IT 14	Express 10	Verify 1
	Determine 3	Report 4	Find 7		Hypothesise 4		Extend 3	Visualise 1
	Develop 18	Reproduce 1	Formulate 1		Identify 33		Factorise 13	Write 2
	Distinguish 1	Research 2	Graph 3				Find 9	
	Discriminate 2	Respond 20	Identify 70				Formulate 4	
	Discuss 30	Retrieve 1						
	Draft 1	Review 3						
	Draw *on/from* 22	Select 21						
	Edit 7	Share 4						
	Elaborate 3	Sequence 14						
	Engage 13	Solve problem 3						
	Enhance 2	Speak 17						
	Evaluate 51	Spell 8						
	Examine 8	Substantiate 3						
	Exchange 1	Substitute 1						
	Expand 2	Summarise 5						
	Experiment 17	Synthesise 5						
	Explain 15	Talk 1						
	Explore 34	Test 1						
	Express 14	Transform (text) 5						
	Extend 9	Understand 55						
	Find 2	Use IT 4						
	Formulate 1	View 10						
	Identify 57	Write 16						
	Illustrate 2							

continued

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	English	History	Science	Mathematics
Most frequent skills in learning area	Abstraction (4); Access info (4); Acknowledge (7); Adapt (14); Add (15); Adjust (4); Affirm (1); Analyse (69); Answer*(12)*+Respond*(52)*= (64); Apply (11); Appraise (2); Appreciate (6); Argue (10); Ask*(30)*+Request*(3)*+Question*(6)* =(39); Assess(7); Assign (1); Attend to (1); Brainstorm (1); Build *on ideas(7)*+Construct *(32)*+Reconstruct(1)=(40); Challenge (3);Change (7); Check (15); Choose*(18)*+Select *(51)*=(69); Clarify (19); Combine (22); Comment (17); Communicate (19); Compare (64); Compile (1); Compose (4); Comprehend (1); Conclude*(10)*+Infer*(9)*+Imply *(1)*=(20); Confirm (4); Connect*(43)*+Link*(14)* =(57); Consensus(1); Consider (33); Consolidate (1); Contrast (14); Contribute (11); Convey (18); Cooperate*(1)*+Collaborate*(11)*=(12); Create (159); Creative (6); Critical*(4)*+Critique*(2)*=(6); Debate (13); Decide (4); Defend (1); Define (2); Demonstrate (7); Describe (31); Design (2); Determine (5); Develop (55); Differentiate*(2)*+Distinguish*(3)*+Discriminate*(2)*=(7); Disagree (1); Discover (1); Discuss (89); Display (1); Draft (5); Draw (7); Draw *on/from* (44); Edit (24); Elaborate (4); Engage (34); Enhance (5); Evaluate (71); Examine (24); Expand (8); Experiment (33); Explain (34); Explore (94); Express (50); Extend (31); Feedback (3); Find (10); Formulate (2); Gather (5); Group (13); Identify (145); Illustrate (2); Imitate (2); Improve (9); Incorporate (5); Influence (17); Inform (8); Initiate (3); Innovate (6); Integrate (6); Interact (22); Interpret (55); Interrogate (2); Introduce (2); Invent (1); Investigate (19); Judge (3); Justify (7); List (3); Listen (82); Locate (4); Map (2); Match (5); Monitor (10); Narrate (1); Navigate (2); Negotiate (4); Noting (8); Observe (6); Order*(7)*+Reorder*(1)* =(8); Organise (10); Opinion (38); Outline (3); Paraphrase (2); Participate (23); Perform (7); Persuade (10); Plan (22); Position (3); Predict (13); Present (66); Preservation (1); Preview (1); Promote (2); Prompt (3); Publish (11); Read (103); Reasoning (5); Recall*(3)*+Remember*(2)*=(5); Recite (6); Recognise (77); Record (4); Refine (6); Reflect (21); Refute (1); Rehearse (8); Relate*(2)*+Retell *(16)*+Recount*(7)* =(25); Repeat (4); Rephrase (2); Replace (3); Replicate*(1)*+Reproduce*(2)*=(3); Report (15); Represent (5); Research (11); Retrieve (2); Review (8); Revise (3); Role play (3); Scan (2); Self-correct (9); Self-monitor (2); Share*(25)*+ Exchange*(2)*= (27); Sequence*(52)*; Solve problems (7); Speak*(48)*+Talk*(17)* =(65); Specify(1); Speculate (3);Spell (42); Suggest (1); Substantiate (3); Substitute (1); Summarise (13); Synthesise (5); Test (1); Think (11); Track (2); Transform (5); Under-stand (153); Use ICTs (109); View (37); Visualise (1); Write (69)	Access IT info (1); Acknowledge (3); Advertise (1); Analyse (26); Annotate (3); Appreciate (1); Argue (8); Ask/pose questions (20); Answer*(6)*+ Respond*(1)*=(7); Appreciate (1); Argue (8); Ask/pose questions (20); Brainstorm (1); Build*(2)*+Construct *(4)*+Reconstruct(1)=(7); Categorise (2); Check (2); Choose*(1)*+Select*(8)* =(9); Combine (4); Comment (2); Communicate (31); Compare (31); Compile (3); Compose (11); Conclude (8); Connect(2)+Link(3)= (5); Consider (5); Conserve*(2)*+Preserve*(1)*+ Protect*(2)*=(5); Consolidate (5); Contrast (1); Cooperate (1)+Collaborate (1)=(2); Create (31); Debate (1); Define (4); Demonstrate (2); Describe (77); Design (5); Detect (1); Determine (4); Develop (59); Discover (3); Discuss (23); Distinguish *(7)*+ Differentiate *(1)*=(8); Draft (1); Dramatise (1); Draw (4); Draw *on/from* (3); Edit (1); Engage (1); Enhance (3); Evaluate (10); Examine (40); Experiment (1); Explain (84); Explore (23); Find (18); Formulate (1); Graph (4); Identify (128); Illustrate (2); Incorporate (5); Inform (9); Innovate (3); Inquire (43); Interpret (20); Interview (2); Investigate (81); Judge (1); List (8); Listen (4); Locate (31); Map (7); creating models (1); Name (1); Noting (2); Order (3); Organise (4); Outline (24); Plan (6); Present (16); Process (12); Read (1); Reasoning (1); Recall (1); Recognise (19); Relate*(6)*+Retell*(1)*+ Recount*(3)* =(10); Record (14); Refine (2); Report (3); Represent (11); Research (23); Retrieve (1); Review (5); Role play (5); Search (7); Sequence (26); Share(1)+ Exchange(1)=(2); Speak *(2)*+Talk*(4)*=(6); Suggest (4); Survey (1); Synthesise (3); Think (3); Trace (2); Understand (69); Use ICTs (37); Use sources (2); Write (5)	Access Info (2); Add (2); Analyse *(26)*+Crit analysis *(2)*=(28);Apply (14); Appreciate (4); Ask/pose questions *(14)*+Question*(15)*=(29); Answer questions *(6)*+Respond*(7)*=(13); Argue (8); Assess (2); Calculate (3); Choose*(2)*+Select*(10)*=(12); Claim(10); Clarify (2); Classify (9); Collaborate (16); Combine (5); Communicate (38); Compare (41); Conclude*(6)*+Infer*(1)*=(7); Connect*(3)*+Link*(9)*=(12);Conserve/Protect/Preserve (9); Consider (81); Construct (12); Convey (2); Debate (2); Decide (5); Define (1); Demonstrate (6); Describe (94); Design (4); Develop (37); Discover (1); Discuss (26); Distinguish (8); Drawing (8); Draw *on evidence*(2); Engage (1); Enhance (1); Estimate (2); Evaluate (26); Examine (4); Experiment (16); Explain (19); Explore (55); Find (21); Formulate (3); Gather *(9)*+Collect *(14)* =(23); Graph (23); Group (6); Hypothesise (4); Identify (74); Illustrate (1); Improve (28); Inform (7); Innovate (1); Inquire (29); Interpret (2); Investigate (104); Justify (2); List (1); Locate (1); Match (6); Measure (16); Modelling/making models of (30); Monitor (1); Name (1); Observe (70); Order (1); Organise (7); Outline (1); Participate (2); Plan (24); Predict (39); Present (14); Propose (2); Quantify (4); Rearrange (2); Recognise (59); Record (17); Reflect (6); Relate (4); Report (9); Represent (25); Research (32); Review (2); Role play (3); Sequence (1); Share (13); Simplify (2); Simulate (3); Solve problems (14); Sort (8); Suggest (22); Summarise (2); Survey (5); Test (16); Think (5); Understand (75); Use ICTs (30)	Acknowledge (1); Add (40); Analyse (3); Answer questions (21); Apply (49); Appreciate (1); Argument/proof (3); Ask/pose questions (6); Assign (5); Build*(19)*+Construct*(23)*=(42); Calculate (39); Categorise (3); Check (16); Choose*(15)*+Select*(4)*=19; Classify (10); Combine (5); Comment (4); Communicate (9); Compare (45); Conclude*(5)*+Infer*(1)*+Deduce*(2)*=(8);Connect*(47)*+Link*(3)*=(50); Consider (4); Contrast (9); Convert (9); Convey (1); Copy (1); Count (25); Create (36); Critique (1); Decide (5); Define (7); Derive (6); Demonstrate (12); Describe (109); Design (3); Determine (20); Develop (12); Discuss (3); Display (34); Distinguish (7); Divide (6); Draw (8); Enlarge (2); Establish (13); Estimate (9); Evaluate (19); Expand (6); Experiment (19); Explain (24); Explore (26); Express (10); Extend (7); Factorise (13); Find (17); Follow directions (7); Formulate (12); Gather/Collect (27); Generalise (10); Graph (15); Group*(6)*+Regroup*(3)* =(9); Identify (91); Illustrate (6); Improve (2); Inform (1); Interpret (47); Introduce (2); Investigate (95); Justify (7); List (8); Locate (13); Match (2); Measure (16); Model/using or making models (18); Multiply (7); Name (5); Observe (6); Order (33); Organise (1); Partition (18); Perform (3); Plan (8); Plot (9); Position (1); Predict (7); Present (5); Prove (2); Read (6); Rearrange (5); Reasoning (47); Recall (7); Recognise (69); Record (8); Refine (1); Relate (2); Report (3); Represent (66); Reproduce (6); Sequence (31); Share (3); Simplify (15); Sketch (8); Solve problems (108); Sort (6); Substitute (2); Subtract (33); Suggest (1); Summarise (2); Survey (6); Symbolise (1); Test*(1)*+Trial*(2)*=(3); Think (1); Understand (100); Use ICTs (53); Verify (3); Visualise (4); Write (12);

continued

Full collation of Skills in the Australian National Curriculum

Totals	**Overall Individual Skills: 241 Total skill references: 8038**
Tally in alphabetical order	Abstraction (4); Access Info (7); Acknowledge (11); Adapt (14); Add (57); Adjust (4); Advertise (1); Affirm (1); Analyse (126); Annotate/Note (13); Answer/Respond (105); Apply (74); Appraise (2); *Appreciate (12); Argue (29); Ask/Pose Questions(70)+Request(3)+Question(21)+Interrogate(2) = (96); Assess (9); Assign (6); Attend to (1); Brainstorm (2); Build/Construct/Reconstruct (101); Calculating (42); Categorise/Classify (24); Challenge (3); Change(7)+Transform(5)=(12); Check (33); Choose/Choice/Select (109); Claim (10); Clarify (21); Combine (36); Comment (23); Communicate (97); Compare (181); Compile (4); Compose (15); Comprehend (1); Conclude/Infer/Imply/Deduce (43); Confirm (4); Connect/Link (124); Consensus (1); *Conserve/Preserve/Protect (15); Consider (123); Consolidate (6); Contrast (16); Contribute (11); Convert (9); Convey (21); *Cooperate/Collaborate (30); Copy (1); Count (25); *Creating/Creative (232); Critical/Critique(3)/critical analysis (9); Debate (16); Decide (14); Defend (1); Define (14); Demonstrate (27); Derive (6); Describe (311); Design (14); Detect (1); Determine (29); Develop (166); Disagree (2); Discover (5); Discuss (141); Differentiate/Distinguish/Discriminate (30); Display (35); Divide (7); Draft (6); Dramatise/Role play (12); Drawing (27); Draw *on/from* (49); Edit (25); Elaborate (4); Engage (36); Enhance (9); Estimate (11); Evaluate (126); Examine (68); Expand (14); Experimenting (69); Explain (161); Explore (198); Express (60); Extend (38); Factorise (13); Feedback (3); Find (66); Follow directions (7); Formulate (18); Gather/Collect (55); Generalise (10); Graph (42); Group/Regroup (28); Hypothesise *(What if?)* (4); Identify (438); Illustrate (11); Imitate (2); Improve(39)+ Enhance(9)=(48); Incorporate (10); Influence (17); Inform (25); Initiate (3); Innovate(10)+Invent(1)=(11); Inquiring (72); Integrate (6); Interact (22); Interpret (124); Interview (2); Introduce (4); Investigate (299); Judge (4); Justify (16); List (20); Listen (86); Locate (49); Map (9); Match (13); Measure (32); Modelling/making models (49); Monitor (11); Multiply (7); Name (7); Navigate (2); Negotiate (4); Observe (82); Order/Reorder (45); Organise (22); Opinion (give) (38); Outline (28); Paraphrase (2); *Participate (25); Partition (18); Perform (10); Persuade (10); Plan (60); Plot (9); Position (4); Predict (59); Present (101); Preview (1); Process (12); Promote (2); Prompt (3); Propose (2); Prove (2); Publish (11); Read (110); Rearrange (7); Reasoning (53); Recall/Remember (13); Recite (6); Recognise (224); Record (43); Refine (9); Reflection (27); Refute (1); Rehearse (8); Relate/Retell/Recount/Narrate (40); Repeat (4); Rephrase (2); Replace (3); Replicate/Reproduce (9); Report (30); Represent (107); Research (66); Retrieve (3); Review (15); Revise (3); Scan (2); Search (7); Self-correct (9); Self-monitor (2); Share/Exchange (45); Sequence (128); Simplify (17); Simulate (3); Sketch (8); Solve problems (129); Sort (14); Speak/Talk (71); Specify(1); Speculate (3); Spell (42); Substantiate (3); Substitute (3); Subtract (33); Suggest (28); Summarise (17); Survey (12); Symbolise (1); Synthesise (8); Test/Trial (20); Thinking (20); Trace (2); Track (2); Understand (397); Use ICTs (229); Use sources (2); Verify (3); View (37); Visualise (5); Write (86)
Tally of most frequent skills	Identify (438); Understand(397)+Comprehend(1)=(398); Describe (311); Investigate (299); Sequence/Order/Reorder(173)+Group/Regroup(28)+ Categorise/Classify(24)+Sort(14)+Organise(22)=261; Creating/Creative (232); Use ICTs (229); Recognise (224); Explore (198); Compare (181); Develop (166); Explain (161); Discuss (141); Evaluate(126)+Appraise(2)+Judge(4)=(132); Research(66)+Find/find out (66)=(132); Solve problems (129); Analyse (126); Interpret (124); Connect/Link (124); Consider (123); Read (110); Choose/Choice/Select (109); Represent (107); Answer/Respond (105); Present (101); Build/Construct/Reconstruct (101); Express(60)+(give)Opinion(38)=(98); Communicate (97); Ask/Pose Qs(70)+Request(3)+Question(21) + Interrogate(2)=(96); Write (86); Listen (86); Observe (82); Apply (74); Inquiring (72); Speak/Talk (71); Experiment (69); Examine (68); Plan (60); Predict (59); Add (57); Gather/Collect (55); Reasoning (53); Extend (38)+Expand(14)=(52); Modelling/making models (49); Locate (49); Draw *on/from* (49); Improve(39)+ Enhance(9)=(48); Share/Exchange (45); Record (43); Conclude/Infer/Imply/Deduce (43); Calculating (42); Spell (42); Graph (42); Relate/ Retell/Recount/Narrate (40); View (37); Engage (36); Check/Verify (36); Combine (36); Display (35); Drawing(27)+Sketch (8)=(35); Subtract (33); Measure (32); Report (30); Differentiate/ Distinguish/Discriminate (30); *Cooperate/Collaborate (30); Argue (29); Determine (29); Suggest (28); Outline (28); Reflection (27); Demonstrate (27); Participate (25); Count (25); Inform (25); Edit (25); Comment (23); Interact (22); Justify(16)+ Substantiate(3) +Prove(2)=(21); Convey (21); Clarify (21); Test/Trial (20); Thinking (20); List (20); Formulate (18); Partition (18); Influence (17); Simplify (17); Summarise (17); Contrast (16); Debate (16); Compose (15); *Conserve/Preserve/Protect (15); Review (15); Adapt (14); Decide (14); Define (14); Design (14); Factorise (13); Match (13); Note/Annotate (13); Recall/Remember (13); *Appreciate (12); Dramatise/Role play (12); Process (12); Survey (12); Change(7)+Transform(5)=(12); Acknowledge (11); Contribute (11); Estimate (11); Illustrate (11); Innovate/Invent (11); Monitor (11); Publish (11); Claim (10); Generalise (10); Incorporate (10); Perform (10); Persuade (10); Assess (9); Convert (9); Critical/Critique (3)/critical analysis (9); Map (9); Plot (9); Refine (9); Replicate/Reproduce (9); Self-correct (9); Rehearse (8); Synthesise (8); Access Info (7); Divide (7); Follow directions (7); Multiply (7); Name (7); Search (7); Speculate (3)+Hypothesise *(What if?)*(4)=(7); Assign (6); Consolidate (6); Derive (6); Draft (6); Integrate (6); Recite (6); Substitute(3)+Replace(3) =(6); Discover (5); Visualise (5); Abstraction (4); Adjust (4); Compile (4); Confirm (4); Elaborate (4); Introduce (4); Negotiate (4); Position (4); Repeat (4); Rephrase(2)+Paraphrase(2)=(4); Trace(2)+Track(2)=(4); Challenge (3); Feedback (3); Initiate (3); Prompt (3); Retrieve (3); Revise (3); Verify (3); Simulate (3); Brainstorm (2); Disagree (2); Imitate (2); Interview (2); Navigate (2); Promote (2); Propose (2); Scan (2); Self-monitor (2); Use sources (2); Advertise (1); Affirm (1); Attend to (1); Consensus (reach) (1); Copy (1); Defend (1); Detect (1); Preview (1); Refute (1); Specify (1); Symbolise (1); *(*Also identified as values in the curriculum analysis)*

From: English, History, Science, and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d and 2010e).

APPENDIX 49

Referred to in Chapter 10, Volume 1

**References to the 'recognition' of Indigenous peoples, and diverse cultures
and languages in the Australian National Curriculum**

Learning area	Year level	Curriculum Description
English	F	recognising that there are storytellers in all cultures recognising cultural patterns of storytelling recognising that for some ATSI stories the sequence of events may be cyclical
	2	recognising some phrases in the languages of the class and community
	5	recognising the diversity of people's experiences within a cultural group such as differences in setting and lifestyle between urban and remote ATSI peoples
	6	recognising that there are more than 150 Aboriginal languages and two Torres Strait Islander languages
	6	recognising that all languages and dialects are of equal value
History	F	recognising that the country, place and traditional custodians of the land or sea are acknowledged at ceremonies and events as a mark of respect
Science	7	recognising that traditional and Western scientific knowledge can be used in combination to care for Country and Place
Mathematics	F	recognise ways of counting in local languages and across cultures recognise that other cultures may count in a variety of ways

From: English, History, Science, and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d and 2010e).

APPENDIX 50

Referred to in Chapter 10, Volume 1

Examples of the skill of 'problem solving' in the Australian National Curriculum

Learning area	Year level	Curriculum Description
English **Total:** problem solving 7	1 and 2	discussing how plots develop including: beginnings, how the problem is introduced and solved (x2)
	2	using spoken language for problem solving, and exploring ideas and concepts
	3	exploring texts that highlight issues and problems in making moral decisions
	8	exploring texts that attempt to solve moral problems in a particular way e.g. by consideration of consequences or rights/duties
	9	collaborate and negotiate with others to solve problems
	10	engage in discussions that build on others' ideas, and solve problems
History	**Nil**	
Science **Total:** problems 24 problem solving 14	5 and 6	scientific understandings, discoveries and inventions are used to solve problems that directly affect peoples' lives (x2) pose questions to clarify practical problems or inform a scientific investigation (x2) select investigation methods to answer questions or solve problems (x2) suggest improvements to the methods used to investigate a question or solve a problem (x2)
	6	identify problems that relate to students' lives
	7 and 8	identify questions and problems that can be investigated scientifically (x2) working collaboratively to identify a problem to investigate (x2) reflect on the method used to investigate a question or solve a problem (x2) communicate ideas, findings and solutions to problems using scientific language (x2) students pose questions and apply scientific concepts to everyday problems identify where science knowledge is used to propose solutions to problems
	8	describe a situation where scientific knowledge has been used to solve a real-world problem.
	9 and 10	using internet research to identify problems that can be investigated (x2) evaluate the approaches used to solve problems (x2)
Mathematics	F	*Understanding, Fluency, Problem Solving and Reasoning* are an integral part of mathematics content **Problem Solving includes using materials to model authentic problems, sorting objects, using familiar counting sequences to solve unfamiliar problems, and discussing the reasonableness of the answer**
	1	*Understanding, Fluency, Problem Solving and Reasoning* are an integral part of mathematics content **Problem Solving includes using materials to model authentic problems, giving and receiving directions to unfamiliar places, and using familiar counting sequences to solve unfamiliar problems** Represent and solve simple addition and subtraction problems developing a range of mental strategies for addition and subtraction problems solve simple addition and subtraction problems
	2	*Understanding, Fluency, Problem Solving and Reasoning* are an integral part of mathematics content **Problem Solving includes formulating problems from authentic situations, making models and using number sentences that represent problem situations, planning routes on maps, and matching transformations with original shape** using counting on to identify the missing element in an additive problem solve simple addition and subtraction problems

Learning area	Year level	Curriculum Description
Mathematics	2	becoming fluent with mental strategies for addition/subtraction problems representing array problems with available materials represent division as grouping into equal sets and solve simple problems using these representations solve problems by using number sentences for addition or subtraction representing a word problem as a number sentence writing a word problem to represent a number sentence represent problems involving addition and subtraction by number sentences.
	3	*Understanding, Fluency, Problem Solving and Reasoning* are an integral part of mathematics content **Problem Solving includes formulating and modelling authentic situations involving planning methods of data collection and representation, making models of three-dimensional objects and using number properties to continue number patterns** regroup numbers to at least 10 000 to assist calculations and solve problems represent and solve problems involving multiplication writing simple word problems in numerical form
	4	*Understanding, Fluency, Problem Solving and Reasoning* are an integral part of mathematics content **Problem Solving includes formulating, modelling and recording authentic situations involving operations, comparing large numbers and time durations, and using properties of numbers to continue patterns** regroup numbers … to assist calculations, solve problems solve problems involving purchases and the calculation of change solve word problems involving multiplication, division representing a word problem as a number sentence writing a word problem using a given number sentence solve simple time problems solve problems by using number sentences involving the four operations solve problems involving time duration.
	5	*Understanding, Fluency, Problem Solving and Reasoning* are an integral part of mathematics content **Problem Solving includes formulating and solving authentic problems using numbers and measurements, creating transformations and identifying line and rotational symmetries** use factors and multiples of whole numbers to solve problems solve problems involving multiplication by two-digit numbers solve problems involving division by a one digit number apply appropriate digital technologies to solve problems investigate ways to solve problems with addition/subtraction of fractions modelling and solving addition and subtraction problems involving fractions using relevant problems to develop number sentences solve multiplication and division problems.
	6	*Understanding, Fluency, Problem Solving and Reasoning* are an integral part of mathematics content **Problem Solving includes formulating and solving authentic problems using numbers and measurements, creating similar shapes through enlargements, representing secondary data, and calculating angles** special number properties can be used to solve problems apply appropriate digital technologies to solve problems applying strategies already developed for solving problems involving small numbers to those involving large numbers applying a range of strategies to solve realistic problems

Learning area	Year level	Curriculum Description
Mathematics	6	solving everyday additive problems involving positive and negative integers solve problems involving addition and subtraction of fractions solving realistic additive (addition and subtraction) problems involving fractions modelling and solving additive problems involving fractions practising methods for solving problems requiring operations on decimals choosing the appropriate number representations for the problem being solved solve problems involving comparison of lengths and areas using units connect fractions, decimals and percentages as different representations of the same number and solve associated problems choose appropriate units of measurement to solve problems.
	7	*Understanding, Fluency, Problem Solving and Reasoning* are an integral part of mathematics content **Problem Solving includes formulating and solving authentic problems using numbers and measurements, creating transformations and identifying symmetry, calculating angles and interpreting sets of data collected through chance experiments** solving problems involving lowest common multiples, greatest common divisors solve problems involving addition and subtraction of fractions developing efficient strategies to solve additive problems involving fractions justify choices of written, mental or calculator strategies for solving problems using authentic problems to express quantities as percentages of amounts recognise and solve problems involving simple ratios understanding that rate and ratio problems can be solved using fractions or percentages and choosing the best way to solve a particular problem identifying order of operations in contextualised problems solving real-life problems by using pronumerals to represent unknowns use the formulas for areas of rectangles/triangles/parallelograms in problem solving use area formulas for rectangles/triangles to solve problems involving surface areas solve simple numerical problems using reasoning
	8	*Understanding, Fluency, Problem Solving and Reasoning* are an integral part of mathematics content **Problem Solving includes formulating and modelling, with comparisons of ratios, profit and loss, authentic situations involving areas and perimeters of common shapes and analysing and interpreting data using two-way tables** solve problems involving the use of percentages using percentages to solve problems involving mark-ups and discounts solve a range of problems involving rates and ratios understanding that rate and ratio problems can be solved using fractions or percentages and choosing most efficient form to solve a particular problem solve problems involving profit and loss use formulas to solve problems involving circumference and area use formulas to solve problems involving volume solve problems involving duration solving problems using the properties of congruent figures solve numerical problems related to quadrilateral properties using reasoning use the sum of probabilities to solve problems represent events in two-way tables and Venn diagrams and solve problems solve problems involving percentages solve a range of everyday problems involving rates and ratios use the sum of probabilities to solve problems choose units of measurement for area and volume and solve problems solve problems involving circumference and area establish properties of quadrilaterals and solve related numerical problems solve problems involving time duration.

Learning area	Year level	Curriculum Description
Mathematics **Total:** problems 123 problem solving 108	9	*Understanding, Fluency, Problem Solving and Reasoning* are an integral part of mathematics content **Problem Solving includes calculating surface areas and volumes of right prisms, applying ratio and scale factors to similar figures, solving problems involving right-angle trigonometry, and collecting data from secondary sources to investigate an issue** solve problems involving direct proportion explore the relationship between graphs/equations corresponding to simple rate problems understanding the difference between direct and inverse proportion, identifying these in real-life contexts and using these relationships to solve problems solve problems involving simple interest partitioning composite shapes into rectangles and triangles is a strategy for solving problems involving perimeter and area calculate the surface area and volume of cylinders and solve related problems solve problems involving the surface area and volume of right prisms solve problems involving enlargement using the properties of similarity and ratio solve problems using ratio and scale factors in similar figures investigate Pythagoras' Theorem and its application to solving simple problems apply trigonometry to solve right-angled triangle problems solve problems involving simple interest investigate similar/congruent triangles and problems involving Pythagoras' theorem use trigonometry to solve right-angled triangle problems.
	10	*Understanding, Fluency, Problem Solving and Reasoning* are an integral part of mathematics content **Problem Solving includes calculating the surface area and volume of a diverse range of prisms, finding unknown lengths and angles using applications of trigonometry, using algebraic and graphical techniques to find solutions to simultaneous equations and inequalities, and investigating independence of events and their probabilities** calculate compound interest and solve related problems represent word problems with simple linear equations and solve them solve problems involving linear equations represent word problems with simple linear inequalities and solve them generalise pairs of equations from word problems and choose an appropriate strategy for solving them solve problems involving parallel and perpendicular lines represent word problems as equations and solve them to answer the question solve problems involving surface area and volume for a range of prisms, cylinders and composite solids solve right-angled triangle problems apply Pythagoras's Theorem and trigonometry to problems in surveying and design solve problems involving volume and surface area of a range of prisms apply trigonometry to solve right-angled triangle problems.
	10A	apply the factor and remainder theorems to solve problems
Grand Totals:		**Problems (147)**　　　　**Problem solving (129)**

From:
English, History, Science, and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d and 2010e).

APPENDIX 51

Referred to in Chapter 10, Volume 1

Examples of the use of the term 'thinking' in the Australian National Curriculum

Learning area	Year level	Curriculum Content
English	F	building a vocabulary for thinking and talking about school topics
	2	think/pair/share activities
	4	identifying ways thinking verbs are used to express opinion, for example 'I think', 'I believe'
History		the thinking of Copernicus
Science	F	thinking about how the materials used in buildings and shelters are suited to the local environment
	1-2	Thinking about "What will happen if...?" *(Note: hypothesising linked to futures)*
	3-4	think of possible areas for investigation
Mathematics	6	algebraic thinking

From: English, History, Science, and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d and 2010e).

APPENDIX 52

Referred to in Chapter 10, Volume 1

References to the use of Information and Communication Technology in the Australian National Curriculum

Learning area	Year level	Content in learning areas
English	F	understand concepts about print and screen, including how books, film and simple digital texts work learning about layout and navigation of digital/screen texts learning about simple functions of keyboard and mouse including typing letters, scrolling, selecting icons and drop-down menu using familiar and common letters in handwritten and digital communications using digital technologies to retell events and recreate characters construct texts using software including word processing programs using simple functions of keyboard and mouse including typing letters, scrolling, selecting icons and drop-down menu listening and responding to oral and multimodal texts including … various types of digital texts viewing stories by Aboriginal and Torres Strait Islander storytellers from online sources
	1	recreate texts imaginatively using … digital forms of communication retelling key events in stories using oral language, arts, digital technologies and performance media construct texts … using software including word processing programs creating digital images and composing a story or information sequence on screen using images and captions adding images to digital written communications such as emails with pictures of self, classmates or location understand concepts about print and screen, … using navigation buttons, bars and links learning about how books and digital texts are organised including … images with captions and the use of scrolling to access digital texts retelling the events or key information in the text … through digital or arts media using elements in books and screen texts, e.g. sound and movement, to support reading adding or deleting words on page or screen to improve meaning

Learning area	Year level	Content in learning areas
English	2	students engage with a variety of texts … and digital stories drawing, writing and using digital technologies construct texts featuring print, visual and audio elements using software, including word processing programs know some features of text organization including page and screen layouts experimenting with and combining elements of software programs to create texts learning about features of screen texts including menu buttons, drop down menus, links and live connections making significant changes to their texts using a word processing program create events and characters using different media creating imaginative reconstructions of stories and poetry using a range of print and digital media orally, in writing or using digital media, constructing a sequel to a known story recognising recurring characters .. in Dreaming stories experienced through texts, films and online sources investigating Aboriginal stories, found from online sources composing stories to compare past and present daily life (e.g. by using software to create a soundscape of the local area and a digital camera to take photographs)
	3	students engage with a variety of print and digital texts identify the features of online texts that enhance navigation use software including word processing programs with growing speed and efficiency using features of relevant technologies to plan, sequence, compose and edit multimodal texts using search tools to locate information in written and digital texts efficiently using print and digital resources to gather information about a topic using glossaries, print and digital dictionaries and spell check to edit spelling

Learning area	Year level	Content in learning areas
English	4	students interact … in a range of face-to-face and online/virtual environments students engage with a variety of print and digital texts use a range of software including word processing programs to construct, edit and publish written text, and select, edit and place visual, print and audio elements identifying and selecting appropriate software programs for constructing text identify features of online texts … including navigation, links, graphics and layout participating in online searches for information using navigation tools and discussing similarities and differences between print and digital information commenting orally, in written form and in digital reviews inferring meaning from the ways communication occurs in digital environments using research from print and digital resources to gather ideas
	5	students interact … in a range of face-to-face and online/virtual environments students engage with a variety of print and … media texts including newspapers, film and digital texts use a range of software including word processing programs with fluency to construct, edit and publish written text, and select, edit and place visual, print and audio elements writing letters in print and by email, composing with increasing fluency, accuracy and legibility how texts can be composed and presented in written, digital and multimedia forms examining how conventions of punctuation are used in written and digitally composed lists compare texts to the ways hyperlinked digital texts are organised comparing sequences of images revealed through different hyperlink choices using digital media, giving a considered interpretation and opinion about a literary text integrating and linking ideas from a variety of print and digital sources evaluating … the accuracy and currency of print and digital sources using research from print and digital resources how the organisation of texts into home pages and sub pages for online texts … can be used to … assist navigation
	6	students interact … in a range of face-to-face and online/virtual environments students engage with a variety of print and … media texts including newspapers, film and digital texts using technologies to collaboratively prepare a humorous, dynamic group view on a debatable topic use a range of software, including word processing programs, learning new functions as required to create texts selecting and combining software functions as needed to create texts creating narratives in written, spoken or multimodal/digital format comparing the structures and features of different texts, including print and digital sources comparing content from a variety of textual sources including media and digital texts choosing and experimenting with text structures, language features, images and digital resources

Learning area	Year level	Content in learning areas
English	7	students interact … in a range of face-to-face and online/virtual environments students engage with a variety of print and … media texts including newspapers, film and digital texts how language evolves to reflect a changing world, particularly in response to the use of new technology for presenting texts and communicating, such as texting, emoticons and email analyse and explain the effect of technological innovations on texts, particularly media texts investigating the influence on written language of communicative technologies like SMS, text, email and Twitter analysing the impact of interactive elements of digital magazines use a range of software, including word processing programs, to create, edit and publish written and multimodal texts understanding conventions associated with software and using them appropriately e.g. timing scenes in animation experimenting with digital storytelling conventions online texts rely on site maps or breadcrumb trails
	8	students interact … in a range of face-to-face and online/virtual environments students engage with a variety of print and … media texts including newspapers, film and digital texts how mobile technologies are influencing language uses and structures analysing the ways that identity may be created in digital contexts use a range of software, including word processing programs, to create, edit and publish texts imaginatively analysing the relationship between visual elements and text in texts such as online newspapers and digital magazines combining visual and digital elements to create layers of meaning using print and digital/online thesauruses and dictionaries create imaginative, informative and persuasive texts using digital elements integrating multimodal approaches within a spoken presentation using print and digital/online thesauruses.
	9	students interact … in a range of face-to-face and online/virtual environments students engage with a variety of print and … media texts including newspapers, film and digital texts use a range of software, including word processing programs, flexibly and imaginatively to publish texts applying word processing functions, e.g. outlining, standard styles and indexing create … texts that integrate visual, print and/or audio features creating imaginative … written, spoken and digital texts
	10	students interact … in a range of face-to-face and online/virtual environments students engage with a variety of print and … media texts including newspapers, film and digital texts reproducing and adapting existing print texts for an online environment how texts are influenced by different technological affordances e.g. hyperlinks in hypertext narratives using appropriate metalanguage associated with digital technologies to analyse reading pathways on websites

continued

Learning area	Year level	Content in learning areas
English (109)	10	use a range of software, including word processing programs … to create, edit and publish texts designing a webpage that combines navigation, text, sound and moving and still images analysing and experimenting with combinations of graphics, text and sound in the production of multimodal texts such as documentaries, media reports, online magazines and digital books assessing the impact of hyperlinked text in a website's navigation using appropriate metalanguage associated with digital technologies to analyse reading pathways on websites create sustained texts that combine specific digital or media content identifying and analysing ethical positions on a current issue debated in blogs or online discussion forums creating spoken, written and multimodal texts
History	F	use a range of communication forms … and digital technologies how the stories of families and the past can be communicated, e.g. through oral histories, digital media.
	1	use a range of communication forms … and digital technologies
	2	use a range of communication forms … and digital technologies examining sources … online … located through state and local library websites investigating the history of a chosen person … using … audio visual material, digital sources
	3	using information technologies to organise information and make connections (e.g. creating tables in word processing software, concept mapping) using … online collections … to identify the cultural groups within the local community use a range of communication forms … and digital technologies creating an oral, written, pictorial or digital representation
	4	use a range of communication forms … and digital technologies creating charts, pictorial stories, maps, digital and oral presentations to explain the past making a podcast that features a story from the First Fleet
	5	use a range of communication forms … and digital technologies using ICT to create presentations which are suitable for the target audience and include text, images and/or audiovisuals using communication technologies to exchange information and to foster a collaborative response (e.g. a wiki) present information and findings using combinations of written and spoken text, graphics and pictures and in a range of communication forms including digital technologies
	6	using digital technologies to process and record data use a range of communication forms … and digital technologies developing charts, graphs, tables, digital presentations, written and oral presentations to explain the past using ICTs creating a digital story, using text, images and audio/visual material, to record migrant experiences

Learning area	Year level	Content in learning areas
History (37)	7	use a range of communication forms … and digital technologies creating an audio-visual presentation, using ICT students present their findings in a range of forms, in particular written and visual texts, including digital technologies
	8	use a range of communication forms … and digital technologies creating an oral presentation, supported by audio-visual material plan an inquiry and identify relevant historical sources using information technologies students present their findings in a range of forms, in particular written and visual texts, including digital technologies
	9	use a range of communication forms … and digital technologies using online conferencing and other forms of ICT to discuss historical questions and issues identify and locate both primary and secondary sources using information technologies identify and locate relevant sources, using ICT and other methods locating historical sources from archives, museums and online collections present their findings in a range of forms, in particular written and visual texts, including digital technologies
	10	use a range of communication forms … and digital technologies identify and locate a range of primary and secondary sources using information technologies present their findings in a range of forms, in particular written and visual texts, including digital technologies
Science	F	-
	1	collect and record observations, with the assistance of digital technologies
	2	collect and record observations, with the assistance of digital technologies
	3	make and record observations, using formal measurements and digital technologies using a digital camera to record observations
	4	using formal measurements and digital technologies using a digital camera to record observations
	5	observe, measure and record data, using digital technologies, adding information to tables, graphs and spreadsheets represent and describe observations, patterns or relationships in data using digital technologies
	6	observe, measure and record data, using digital technologies describe observations, patterns or relationships in data using digital technologies
	7	using a digital camera to record observations and compare images using information technologies represent and analyse patterns or relationships, including using digital technologies using spreadsheets to aid the presentation and simple analysis of data communicate ideas, findings and solutions to problems .. using digital technologies using digital technologies to access information and to communicate and collaborate

Learning area	Year level	Content in learning areas
Science (30)	8	examining a variety of cells using a light microscope, by digital technology using a digital camera to record observations and compare images using information technologies represent and analyse patterns or relationships, including using digital technologies using spreadsheets to aid the presentation and simple analysis of data communicate ideas, findings and solutions to problems .. using digital technologies using digital technologies to access information and to communicate and collaborate
	9	considering how communication methods are influenced by new mobile technologies using modelling and simulations, including using digital technology to investigate situations and events select and use … digital technologies, to … collect and record data using probes and data loggers to record information
	10	considering how information technology can be applied to different areas of science how the computing requirements in … modern science depend on people working in … information technology using modelling and simulations, including using digital technology to investigate situations and events select and use … digital technologies, to … collect and record data identify where digital technologies can be used to enhance the quality of investigations
Mathematics	F - 1	-
	2	describe and draw two-dimensional shapes, with and without digital technologies investigate the effect of one-step slides and flips with and without digital technologies
	3	solve problems involving multiplication using … appropriate digital technologies collect data, organise into categories and create displays using lists, tables, picture graphs and column graphs, with/without digital technologies
	4	use appropriate digital technologies for multiplication and for division solve problems involving purchases and the calculation of change with and without digital technologies describe two dimensional shapes with and without the use of digital technologies create symmetrical patterns, pictures and shapes with and without digital technologies creating angles and comparing them to a right angle using digital technologies construct suitable data displays, with and without the use of digital technologies
	5	solve problems involving multiplication of large numbers … using … appropriate digital technologies apply appropriate digital technologies to solve problems representing two-dimensional shapes such as photographs, sketches and images created by digital technologies identifying and describing the symmetry of two dimensional shapes … using digital technologies identifying the effects of transformations … of two dimensional shapes by using digital technologies using digital technologies to enlarge shapes construct displays … with and without the use of digital technologies comparing data representations for different data sets to help decision making, such as choosing the best mobile phone plan

Learning area	Year level	Content in learning areas
Mathematics (53)	6	select and apply … appropriate digital technologies to solve problems find a simple fraction of a quantity … with and without digital technologies add and subtract decimals, with and without digital technologies multiply decimals by whole numbers and perform divisions … with and without digital technologies calculate percentage discounts … on sale items, with and without digital technologies recognising and investigating familiar objects using … digital technologies investigate combinations of translations, reflections and rotations, with and without the use of digital technologies describing the effects of transformations … using computer technology to visualise, test and record the movement of two-dimensional shapes investigate angles, with and without digital technologies conduct chance experiments … using appropriate digital technologies
	7	multiply and divide fractions and decimals using … digital technologies investigating multiplication of fractions and decimals … with … digital technologies express one quantity as a fraction of another, with and without the use of digital technologies find percentages of quantities and express one quantity as a percentage of another, with and without digital technologies investigate and calculate 'best buys', with and without digital technologies develop formulas for the area of triangles, using … digital technologies using digital technologies to experiment with, create and re-create patterns using combinations of flips using … digital technologies to investigate the angle sum of a triangle and quadrilateral using dynamic geometry software (x2)
	8	carry out the four operations with integers using … appropriate digital technologies solve problems involving the use of percentages … with and without digital technologies solve a range of problems involving rates and ratios, with and without digital technologies solve problems involving profit and loss, with and without digital technologies plot linear relationships on the Cartesian plane with and without the use of digital technologies
	9	sketch simple non-linear relations with and without the use of digital technologies using graphing software (x2)
	10	connect the compound interest formula to repeated applications of simple interest using appropriate digital technologies solve linear simultaneous equations, using algebraic and graphical techniques including using digital technology explore the connection between algebraic and graphical representations of relations … using digital technology using geometric software to carry out investigations with parallel and perpendicular lines
Total: 229	10A	investigating the features of graphs of polynomials using digital technology use the unit circle to define trigonometric functions, and graph them with and without the use of digital technologies use information technologies to investigate bivariate numerical data sets

From: English, History, Science and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d, and 2010e**).**

APPENDIX 53

Referred to in Chapter 10, Volume 1

Examples of the skill of 'decision making' in the Australian National Curriculum

Learning area	Year level	Curriculum Description
English (2)	3	exploring texts that highlight issues and problems in making moral decisions
	9	reaching an independent decision or shared consensus
History	nil	
Science (10)	5-6	scientific knowledge is used to inform personal and community decisions (x2)
	5	how decisions are made to grow particular plants and crops depending on environmental conditions (S) how scientific developments have improved our understanding of the world and have enabled people to make decisions based on scientific knowledge
	6	identify examples where scientific knowledge is used in decision making
	7	considering decisions made in relation to the recycling of greywater and blackwater (S)
	7	how ATSI knowledge is being used to inform scientific decisions
	9	how scientific arguments are used to make decisions regarding personal and community issues
	10	considering the use of genetic testing for decisions such as genetic counselling how scientific arguments are used to make decisions regarding personal and community issues
Mathematics (5)	F	decide which is longer
	5	using and comparing data representations for different data sets to help decision making
	7	compare costs of items to make financial decisions
	8	making decisions and drawing conclusions based on data
	9	financial decisions can be assisted by mathematical calculations

From: English, History, Science, and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d and 2010e).

APPENDIX 54

Referred to in Chapter 10, Volume 1

References to a 'futures perspective' and hypothetical phrasing in the Australian National Curriculum

Learning area	Year level	Curriculum Description
FUTURES PERSPECTIVE		
English	2	predict likely future events
History	F	distinguish between the past, present and future
	1	how the present, past and future are signified by terms indicating time; distinguish between the past, present and future
	2	distinguish between the past, present and future
	10	preservation of natural areas for future generations (S) *Note: intergenerational equity*
Science	1-2	Thinking about "What will happen if...?" (x2) *Note: hypothesising or speculating about the future*
	3	how posing questions helps us plan for the future
	10	predicting future applications and impacts of Science and technology on people's lives
Mathematics	4	protect future bird populations (S)
Note: These examples do not include specific instances of 'planning' or 'predicting', only specific references to 'futures' perspectives.		
HYPOTHETICAL PHRASING		
Learning area	**Year level**	**Curriculum Description**
History	5	creating 'what if' scenarios by constructing different outcomes for a key event
Science	1-2	thinking about "What will happen if...?" type questions about everyday objects and events (x2)
	2	considering what might happen to humans if there were a change in a familiar available resource, such as water

From:
English, History, Science, and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d and 2010e).

APPENDIX 55

Referred to in Chapter 10, Volume 1

References to conducting experiments and making or using models in the Australian National Curriculum

Learning area	Year level	Curriculum content in the learning area
CONDUCTING EXPERIMENTS (excluding 33 references to experimenting with texts in English)		
Science (16)	5	testing predictions relating to the behaviour of solids, liquids and gases by conducting observational experiments considering different investigation methods, including experimental testing
	6	considering different investigation methods, including experimental testing
	7	plan and conduct a range of investigation types, including fieldwork and experiments
	8	use experimentation to isolate relationships between components in systems conduct a range of investigation types, including fieldwork and experiments
	9	plan, select and use appropriate investigation methods, including … laboratory experimentation combining research … with students' own experimental investigation considering the potential hazards … used in experimental investigations presenting results and ideas using formal experimental reports plan experimental procedures
	10	plan, select and use appropriate investigation methods, including … laboratory experimentation combining research … with students' own experimental investigation considering the potential hazards … used in experimental investigations presenting results and ideas using formal experimental reports
Mathematics (19)	3	describing outcomes of chance experiments conduct chance experiments conducting repeated trials of chance experiments conduct chance experiments
	5	list outcomes of chance experiments involving equally likely outcomes investigating the probabilities of all outcomes for a simple chance experiment list the outcomes of chance experiments as fractions
	6	inferring from the results of experiments conduct chance experiments with both small and large numbers of trials conducting repeated trials of chance experiments, identifying the variation between trials compare observed frequencies across experiments with expected frequencies
	7	interpreting sets of data collected through chance experiments experiment with, create and re-create patterns construct sample spaces for single-step experiments with equally likely outcomes discussing the meaning of probability terminology (e.g. chance events and experiments)
	9	list all outcomes for two-step chance experiments
	10	determining probabilities of multiple experiments describe the results of two- and three-step chance experiments determine probabilities for chance experiments
Total: 35		

APPENDIX 55 (continued)

Learning area	Year level	Curriculum content in the learning area
MAKING OR USING MODELS		
Science (28)	3	modelling the relative sizes and movement of the sun, Earth and moon
	5	use models for investigating systems modelling the relative size of and distance between Earth, other planets … and the sun understanding how models can be used to represent scientific ideas and constructing physical models to demonstrate an aspect of scientific understanding
	6	understanding how models can be used to represent scientific ideas and constructing physical models to demonstrate an aspect of scientific understanding
	7	use and develop models such as food chains, food webs and the water cycle to represent and analyse the flow of energy and matter through ecosystems **(S)** use models to predict and explain events modelling the relative movements of the Earth, sun and moon researching different ideas used in the development of models of the solar system construct and use a range of representations, including … models to represent and analyse patterns or relationships **(S)**
	8	modelling the arrangement of particles in solids, liquids and gases modelling the arrangement of particles in elements and compounds construct and use a range of representations, including … models to represent and analyse patterns or relationships (S)
	9	how body systems work together to maintain a functioning body using models modelling the structure of atoms modelling chemical reactions in terms of rearrangement of atoms modelling sea-floor spreading models and theories, are contestable and are refined over time historical development of models of the structure of the atom how models can be used to predict the changes in populations due to environmental changes (S) using modelling and simulations … to investigate situations and events
	10	using models and diagrams to represent the relationship between DNA, genes and chromosomes modelling a cycle, such as the water, carbon, nitrogen … (S) using models to describe how energy is transferred … within systems models and theories, are contestable and are refined over time development of the … double helix model for the structure of DNA how computer modelling has improved knowledge and predictability of phenomena such as climate change and atmospheric pollution (S) using modelling and simulations … to investigate situations

APPENDIX 55 (continued)

Learning area	Year level	Curriculum content in the learning area
MAKING OR USING MODELS		
Mathematics (29)	F	problem solving includes using materials to model authentic problems represent practical situations to model addition and sharing
	1	problem solving includes using materials to model authentic problems recognise, model, read, write and order numbers to at least 100 modelling numbers with a range of material and images
	2	making models and using number sentences that represent problem situations comparing and contrasting related models of operations recognise, model, represent and order numbers to at least 1000 using an abacus to model and represent numbers using models such as linking blocks modelling and representing simple additive situations using materials
	3	modelling authentic situations involving planning methods of data collection and representation making models of three-dimensional objects recognise, model, represent and order numbers to at least 10, 000 model and represent unit fractions (x2) make models of three-dimensional objects
	4	formulating, modelling and recording authentic situations involving operations
	5	exploring techniques for multiplication such as the area model using arrays to model multiplication modelling and solving addition and subtraction problems
	6	demonstrating equivalence between fractions using drawings and models modelling and solving additive problems involving fractions constructing prisms and pyramids from nets, and skeletal models
	7	solving equations using concrete materials, such as the balance model
	8	problem solving includes formulating and modeling applying the distributive law to the expansion of algebraic expressions using strategies such as the area model solving equations using concrete materials, such as the balance model
	10	using the area model inversely to factorise quadratic expressions
	10A	investigating exponential equations derived from authentic mathematical models based on population growth
Total: 57		

From:
The Science and Mathematics learning areas in the Australian National Curriculum
(ACARA, 2010b and d).

APPENDIX 56

Referred to in Chapter 10, Volume 1

References to 'interconnected understandings' in the Australian National Curriculum

Learning area	Year level	Curriculum Description
English whole - 1 relationships - 4 link/connect - 57 patterns - 33 trends - 0 sequences - 52 **Total: 147**	F-1	making connections between the text and students' own experiences observe patterns in texts, spelling, language, grammar, vowels, sounds, interactions recognise cultural patterns of storytelling understand patterns of repetition replicating sound patterns in stories, rhymes, songs, poems from cultures use and understand common visual patterns identify patterns of vocabulary items in texts e.g. part/whole patterns, compare/contrast patterns, cause-and-effect patterns imitating and inventing sound patterns identifying turn-taking patterns in group and pair work sequencing ideas in spoken texts correctly-sequenced retelling of narrative texts sequencing events in stories follow the sequence of ideas or events sequencing content according to text structure
	2	follow the sequence of ideas or events sequencing content according to text structure identify sound and word patterns in poems predict likely sentence patterns
	3	making links to students' own lives (i.e. of ATSI experiences) noting similarities describe complex sequences of events plan the sequence of ideas and information sequencing content for clarity and audience impact identify roles and collaborative patterns in students' own groups
	4	compose, sequence and prepare a literary text sequencing content present ideas in a planned sequence in informative and persuasive texts
	5	make links between information and ideas from a number of different sources describe complex sequences explain sequences of images in print texts identifying and comparing sequences of images sequencing ideas logically sequencing content according to that text structure
	6	how the story builds meaning to its climax when we understand the whole identify the relationship between words, sounds, imagery and language patterns selecting and sequencing appropriate content editing for coherence, sequence, effective choice of vocabulary
	7	explain relationships between text features and structures and audience and purpose sequencing information in presentations
	8	analysing the relationship between visual elements and text exploring values in texts that are explained in terms of other values, e.g. the relationship between beautiful and good, or good and happiness sequencing appropriate content in presentations
	9	interaction patterns of the classroom using morphographic patterns sequencing and developing an argument series of sequenced and linked paragraphs in an argument
	10	linear text sequencing principles in print narratives logically sequence and organise content to manage the flow of information and ideas

Learning area	Year level	Curriculum Description
History relationships - 6 link/connect - 5 patterns - 13 trends - 3 sequences - 26 **Total: 53**	F	sequence familiar objects and events
	1	describe the sequence of time ordering references to time in sequence sequence familiar objects and events using visual sequences of time such as a 'days of the week' chart place key events in their family history in sequence
	2	place key events in a time sequence
	3	relationship between language, country, place and spirituality sequence historical people and events study in chronological sequence using timelines
	4-5	sequence historical people and events creating timelines and explaining the sequence study events and people in chronological sequence
	5	settlement patterns
	7	students sequence some of the main events, people and societies
	8	relationships between rulers and ruled the relationship between the emperor, shogun, daimyo (lords) samurai (warriors), workers (e.g. farmers, artisans and traders) links between the household and the extended clan broader patterns of continuity and change patterns of land use
	7-10	understand broad patterns of historical change
	9	broad patterns of historical change settlement patterns
	9-10	sequence events chronologically to demonstrate the relationship between events in different periods and places the relationship between events in different times and places
	3-10	links/connections between peoples, countries, experiences, causes and effects
	10	explain the links between the freedom rides in the United States and Australia broad patterns of historical change impact of government policy on migration patterns
Science relationships - 39 link/connect - 12 patterns - 35 trends - 11 sequences – 1 **Total: 98**	F-2	learn that observations can be organised to reveal patterns, and that these patterns can be used to make predictions about phenomena short and longer term patterns of events that occur on Earth and in the sky observe patterns of growth and change in living things describe patterns and make predictions concepts of time and weather patterns
	3-4	understand relationships between components of simple systems to make predictions Science involves making predictions and describing patterns and relationships conduct class surveys and use tables and simple column graphs to represent data and identify trends and patterns identify and discuss numerical and visual patterns in data
	5	look for patterns and relationships between components of systems and develop explanations for the patterns observed
	5-6	look for patterns and relationships between variables and systems components develop explanations for the patterns observed describe patterns in results represent observations, patterns, relationships in data identify links between systems
	7	relationships between organisms in an environment
	8	isolate relationships between components in systems, link form and function
	7-8	Science knowledge can develop through collaboration and connecting ideas across the disciplines of Science *(Example of transdisciplinarity in practice)*
	9	analyse patterns and trends in data, describe relationships between variables describe interrelationships between Science and technology
	9-10	advances in scientific understanding rely on developments in technology and technological advances are often linked to scientific discoveries global patterns of geological activity and continental movement analysing graphs and data for trends and patterns
	10	relationships between aspects of the living, physical, chemical world applied to systems relationship between DNA, genes and chromosomes relationships between variables and identify inconsistencies use relationships between force, mass … to predict changes in motion of objects fast computers have made possible the analysis of DNA sequencing
	3-10	identify trends, recognise, identify, analyse, describe, show, observe, represent patterns

Learning area	Year	Curriculum Description
Mathematics	F-10	linking/connecting numbers, fractions, events, objects, statistics, data
	F	linking specific days to familiar events understanding includes connecting number names, numerals and quantities connect days of the week to familiar events and actions make connections events and actions with students' everyday family routines continue and create patterns; create patterns in the way numbers are said ATSI spatial patterns create patterns with objects and drawings observing natural patterns in the world creating and describing patterns using familiar counting sequences to solve unfamiliar problems understand the language and processes of counting by naming numbers in sequences reading stories from other cultures featuring counting in sequence identifying number words in sequence, and reasoning with number sequences use terms such as 'first' and 'second' to indicate ordinal position in a sequence sequence familiar events in time order; count numbers in sequences
	1	understanding includes connecting names, numerals and quantities explaining patterns that have been created describe number patterns formed by skip counting and patterns with objects using place-value patterns and investigating patterns in the number system counting number in sequences readily forward and backwards use familiar counting sequences to solve unfamiliar problems develop confidence with number sequences to and from 100 use place-value patterns beyond to generalise the number sequence recognise and communicate number sequences.
	2	understanding includes connecting names, numerals and quantities demonstrating and using models such as linking blocks describing connections between 2-D and 3-D representations explore, recognise and understand the connection between addition and subtraction recognising the connection between seasons and weather patterns identify and recognise patterns in number sequences; sketch next element in the pattern describe patterns with numbers and predicting and reproducing a pattern representing the pattern on a number line investigating features of number patterns describing the relationship between addition and subtraction connect number calculations with counting sequences; count numbers in sequences investigate number sequences, increasing and decreasing by twos, threes, fives, ten develop fluency and confidence with … calculations by saying number sequences recognising patterns in number sequences; recognise, communicate number sequences
	3	understanding includes connecting number representations with number sequences recognise, demonstrate, explain the connection between addition and subtraction recognise the connection between multiplication and division continue number patterns identifying and writing the rules for number patterns describing a rule for a number pattern, then creating the pattern recognising the relationship between dollars and cents; relationship between units of time connecting number representations with number sequences establishing multiplication facts using number sequences
	4	understanding includes making connections between representations of numbers connecting division to multiplication creating patterns with shapes … continue patterns make connections between fractions and decimal notation place-value pattern is built on multiplication or division of tens determining patterns in the sequences describe number patterns identifying examples of number patterns create symmetrical patterns use the relationships of the four operations to check the accuracy of calculations exploring the relationship between families of fractions communicating sequences of simple fractions investigate number sequences involving multiples of 3, 4, 6, 7, 8, and 9 sequences can be extended … and many patterns can be determined in the sequences
	5	making connections between representations of numbers recognise the connection between the value of a unit fraction and its denominator connect three-dimensional objects … and two-dimensional representations create and continue patterns with fractions, decimals and whole numbers exploring factors and multiples using number sequences

continued

Learning area	Year level	Curriculum Description
Mathematics relationships – 37 link/connect - 50 patterns - 64 trends - 31 sequences - 31 **Total: 213**	6	connecting fractions, decimals and percentages connect decimal representations to the metric system connect volume and capacity and their units of measurement students connect decimal representations to the metric system generalising number patterns investigating additive and multiplicative patterns such as the number of tiles in a geometric pattern, or the successive repeats of a strip or border pattern, looking for patterns in the way the numbers increase/decrease the Cartesian plane can be used to represent relationships use of rotation, symmetry to represent Indigenous kinship relationships describe results for continuing number sequences create sequences involving whole numbers, fractions and decimals, and describe the rule used to create the sequence
	7	connect fractions, decimals and percentages connect mean, median and range on graphs to real life make connections between whole numbers and index notation describing patterns in uses of indices with whole numbers using patterning and multiplication as repeated addition recognise and describe patterns and investigating different ways to produce the same re-create patterns using combinations of flips creating linear relationships to represent the answer/sequence of operation define alternate, corresponding and allied angles and relationships between them relationship between wealth, education and health … in different countries relationship between the median and mean, and median and mode in data displays creating linear relationships to represent the answer/sequence of operation
	8	connecting rules of relations and functions and their graphs describing patterns in uses of indices and repeating decimals plot/graph linear relationships on the Cartesian plane relationship between features of circles i.e. circumference, area, radius and diameter relationship between volumes of rectangular and triangular prisms
	9	connecting different strategies for simplifying expressions with indices students recognise the connection between similarity and the trigonometric ratios relationship between graphs and equations use the relationships between direct and inverse proportion to solve problems
	10	making the connection between algebraic and graphical representations of relations connecting simple and compound interest in financial contexts connect the compound interest formula to repeated applications of simple interest connecting different strategies for simplifying expressions with indices connect graphical and analytical representations of parallel and perpendicular lines explore the connection between algebraic and graphical representations of relations evaluate statistical reports in media linking claims to displays, statistics and … data describing patterns in uses of indices and relationships between geometrical shapes use expansion patterns for the special binomial products understand the inverse relationship between expansion and factorisation area and volume relationships are used in the workplace and everyday life relationship between areas of similar figures and the ratio of corresponding sides relationship between the corresponding sides of similar right-angled triangles understanding of relationships to deduce properties of geometric figures comment on relationships between two continuous variables describe statistical relationships
	10A	Connect graphical and algebraic representations and describe the transformation many relationships are non-linear and can be represented graphically/algebraically relationship between exponential and logarithmic expressions relationship between algebraic long division and the factor and remainder theorems describing relationships and solving problems associated with quadratics use a straight line to describe the relationship
Grand Total - 511		

From:
English, History, Science, and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d and 2010e).

APPENDIX 57

Referred to in Chapter 10, Volume 1

References to 'systems' in the Australian National Curriculum

Learning area	Year level	Curriculum Description
English (6)	F-1	communication systems (x2)
	3-6	communication systems (x1)
	7-10	spelling systems belief and values systems (x3)
History (22)	1	ATSI kinship system
	6	Westminster system (x2) Australia's system of law and government (x4)
	7	Roman plumbing systems and Indian belief systems (x2)
	8	military and defence systems Ottoman millet system that regarded non Muslim people as subjects not subject to Muslim law Khmer system of water management (x3) Japanese feudal system (x2)
	9	Transport system during Industrial Revolution Westminster system in Australia
	10	interaction of Earth and biosphere unlimited growth is unsustainable biological systems need to remain diverse/productive over time rights of nature humans and natural environment are closely interrelated
Science (92)	2	components of simple systems
	3-6	understanding of a range of systems operating at different time and geographic scales
	3,6,7	understanding of energy flows through simple systems
	3	use understanding of relationships between components of simple systems to make predictions
	4	living things form part of systems some systems change in predictable ways make predictions based on interactions within systems
	5	identify stable and dynamic aspects of systems, and look for patterns and relationships between components of systems investigating systems at astronomical scales Earth is part of the solar system of planets
	6	Earth as a dynamic system, in which changes in one aspect of the system impact on other aspects similarly they see that the growth and survival of living things are dependent on matter and energy flows within a larger system
	7	analyse the flow of energy and matter through ecosystems classify organisms using hierarchical systems how human activity in the community can have positive and negative effects on the sustainability of ecosystems treatment of water in industrial and household systems predict the effect of single changes on systems involving living things

continued

Learning area	Year level	Curriculum Description
	8	body systems design of systems for collecting and recycling household waste Aboriginal people recognise relationships in ecosystems by burning to promote new growth
	9	ecosystems and how energy must be replaced to maintain the sustainability of the system how ecosystems change as a result of events e.g. bushfires, drought, flooding impacts of human activity on an ecosystem body systems
	10	how changes will affect equilibrium within systems on a global scale how human activity affects global systems how change, including that caused by human activity, affects the sustainability of systems at a local and global level
Mathematics (17)	R-10	number systems, decimal systems, metric systems, time systems, reference systems, grid systems, value systems
Total: 137		

From:
English, History, Science, and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d and 2010e).

APPENDIX 58

Referred to in Chapter 10, Volume 1

Examples of references to 'transformation' and 'change' in the Australian National Curriculum

Learning area ↓	Transformation	Year level	Frequency	Change	Year level	Frequency
English	-	F-2		language, text, topic, words, phrases, sentences	F-2	8
	-	3-6		text, meaning, grammar, pronunciation, spelling, tone topic, views, attitudes	3-6	18
	transform texts	7-10	5	change text, word use, grammar, emphasis, world, chronological order	7-10	18
Sub total			**5**			**44**
History	-	F-2		continuity and change over time	F-2	18
	-	3-6		continuity and change, societal change over time	3-6	17
	of the Roman World of Vikings by Christianity of the Modern World	7-10	3	social and environmental change over time	7-10	46
Sub total			**3**			**81**
Science	-	F-2		explore changes in the world that impact on them and changes they can effect seasonal weather changes changes to habitats, materials, events, landscapes sky, objects, resources suggest changes to parks/gardens to meet needs of native animals	F-2	26
	transforming electricity	3-6	2	changes of state, temperature, day and night	3-6	36
	energy transfers and transformations	7-10	4	quantify changes change in object's motion, biological classifications, knowledge, seasons, environment, systems, position, water, ecosystems, disease transmission, populations, nature of matter, variables, chemical, physical science changes understanding changes in matter at a particle level changes between different forms of energy system change through nuclear decay how external changes affect ecosystems how changes affect equilibrium changes in DNA changes caused by natural selection climate change changes to permafrost and sea ice how change affects sustainability of systems	7-10	59
Sub total			**6**			**121**

continued

Learning area ↓	Transformation	Year level	Frequency	Change	Year level	Frequency
Mathematics	Location and transformation match transformations with original shape	F-2	5	-	F-2	
	location and transformation creating patterns with shapes and their transformations creating transformations effects of transformations enlargement transformation describe transformations of two-dimensional shapes transformation of one shape into another combinations of transformations	3-6	15	measures of scale change over time tidal change rotations and reflections can change the position and orientation of shapes and objects	3-6	6
	creating transformations location and transformation understanding transformations produce transformational changes combinations of transformations describe transformations on the Cartesian plane investigating different ways to produce transformational changes.	7-10	15	biodiversity changes describing patterns and investigating different ways to produce transformational changes	7-10	2
Sub total			**35**			**8**
TOTALS			**49**			**210**

From:
English, History, Science and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d, and 2010e).

APPENDIX 59

Referred to in Chapter 10, Volume 1

**Categorisation of skills in the Australian National Curriculum
according to the Unesco four pillars of learning**

Learning **to know** skills	Learning **to do** skills
identify (438), understand/comprehend (398), [1]create (293), recognise (224), compare (181), develop ideas (166), evaluate/ appraise/judge/assess (141), analyse (126), interpret (124), consider (123), link/connect (124), choose/select/decide (123), solve problems (21), plan (60), predict (59), incorporate/ combine/integrate/consolidate (58), improve/enhance/refine (57), review/self-correct/ edit/scan/ revise (54), reason (53), expand/extend (52), draw on/from (49), infer/imply/deduce/ conclude (43), justify/substantiate/prove/defend/claim (32), list/name/ compile (31), differentiate/distinguish/ discriminate (30), determine (29), outline (28), reflect (27), think (20), formulate (18), simplify (17), summarise (17), contrast (16), critical analysis/critique/challenge/disagree/ refute (15), define /specify (15), recall/remember (13), process (12), generalise (10), synthesise (8), speculate/hypothesise (7), discover (5), visualise (5), abstract (4), elaborate (4), initiate (3), retrieve (3), brainstorm (2), navigate (text) (2), self-monitor (2), detect (1), preview (1) symbolise (1), investigate (299), explore (198), find/research (132), observe/view (119), test/trial/experiment (75), inquire (72), examine (68), gather data/collect info (55), modelling (49), locate (49), access info (7), search (7), use sources (2), [2]sequence (299), add (57), calculate/estimate (53), graph (42), check/verify /confirm (40), subtract (33), measure (32), count (25), factorise (13), convert (9), plot (9), divide (7), multiply (7), assign (6), derive (6), solve number problems (108)	[1]create (293), build/construct/reconstruct (101), apply (74) conserve/preserve/protect (15), design (14), trace/track/monitor (15), adapt (14), replicate/reproduce/copy/imitate (12), simulate (3), change/transform (12), illustrate (11), map (9), draft (6), substitute/replace (6), adjust (4), attend to (1), describe (311), explain (161), discuss (141), use IT (116), read (110), represent (107), answer questions/respond (105), present (101), express/give opinion (98), ask/pose questions/interview/request/ question/interrogate (98), communicate (97), listen (86), write (86), speak/talk (71), inform/convey (46), argue/ debate (45), record (43), spell (42), relate/retell/ recount/narrate (40), display(35), report (30), suggest/propose (30) demonstrate (27), persuade/influence (27), comment (23), clarify (21), note/annotate (13), dramatise/role play (12), survey (12), publish (11), perform (10), rehearse (8), follow directions (8), recite (6), introduce (4), position (4) repeat (4), paraphrase/ rephrase (4), promote/advertise (3), feedback (3) prompt (3), affirm (1).
Total: **108 skills, 5223 references**	**Total:** **85 skills, 2793 references**
Learning **to be** skills	Learning **to live** together skills
reflect (27), self-monitor (2), self-correct (9),visualise (5), appreciate (12).	engage/interact (58), share/exchange (45), participate/contribute (36), acknowledge (11), cooperate/collaborate (11), negotiate (4), consensus (1), appreciate (12).
Total: **5 skills, 55 references**	**Total:** **12 skills, 178 references**

[1]**Create** (232) also includes - innovate/invent (11), compose (15), draw/sketch (35) = (293) in both the 'learning to know' and 'learning to do' skills categories.

[2]**Sequence** (128) also includes - order/reorder (45), group/regroup (28), organise (22) categorise/classify (24), sort (14) partition (18), match (13), rearrange (7) = (299) in the 'learning **to know'** skills category.

From:
English, History, Science and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d, and 2010e).

APPENDIX 60

Referred to in Chapter 11, Volume 1

References to global issues in the Australian National Curriculum

Learning area	Year level	Content
English (7) Only in introduction to each year level and one in an achievement standard	7-10	experience learning in both familiar and unfamiliar contexts that relate to the school curriculum, local community, regional and global contexts (x4)
	9-10	texts explore themes of human experience and cultural significance, interpersonal relationships, and ethical and global dilemmas (x2)
	10	explore social issues of global and local concern
History (9) All in introduction to year level or introduction to a topic.	9	impacts of the Industrial Revolution, including global changes in landscapes, transport and communication
	10	study of the history of the modern world and Australia from 1918 to the present, with an emphasis on Australia in its global context transformation of the modern world during a time of political turmoil, global conflict and international cooperation provides a necessary context for understanding Australia's development, its place within the Asia-Pacific region, and its global standing key inquiry questions at this year level are: How did the nature of global conflict change during the twentieth century? How Australian society was affected by other significant global events and changes in this period Topic: The globalising world - Students investigate one major global influence that has shaped Australian society, including the development of the global influence during the twentieth century
Science (8)	6	researching the scientific work involved in global disaster alerts and communication (e.g. cyclone, earthquake, tsunami alerts)
	9	understanding energy and forces to global systems such as continental movement theory of plate tectonics explains global patterns of geological activity and continental movement
	10	relationships between aspects of the living, physical and chemical world are applied to systems on a local and global scale Global systems, including the carbon cycle rely on interactions involving the biosphere, atmosphere how human activity affects global systems factors that drive the deep ocean currents, their role in regulating global climate, and their effects on marine life how change, including that caused by human activity, affects the sustainability of systems at a local and global level
Mathematics (1)	7	investigating the relationship between wealth or education and the health of populations from different countries

From:
English, History, Science, and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d and 2010e).

APPENDIX 61

Referred to in Chapters 11 and 13, Volume 1

References to environmental issues in the Australian National Curriculum

Learning area	Year	Content examples
English (6) (3S)	5	Narrative in ATSI texts which include perspectives of how we should care for the Earth (S) Qualities of contemporary protest songs about Indigenous peoples and the environment How text features advocating community action, e.g. on a local area preservation issue, are used to meet the purpose of the text (S)
	6	Creating informative texts that explore an aspect of biodiversity
	9	How issues are debated and reported in the media in different countries e.g. 'whaling' in Japan and Australia Presenting arguments to persuade others about issues e.g. the importance of maintaining balance in the biosphere (S)
History	2	The history of a significant person, building, site, or part of the natural environment in the local community Examine a point of view about changes to the built and natural environment over time
	3	Continuity over time in the local community, in relation to the areas of transport, work, education, natural and built environments, entertainment, daily life
	4	Investigate pre-contact ways of life of ATSI peoples, including their knowledge of their environment and land management practices ATSI sense of the interconnectedness of Country/Place, People, Culture and Identity and principles, such as caring for country, caring for each other and respecting all things (S) Comparing the European concept of land ownership with ATSI peoples' relationship with the land and sea, and how this affected the environment Examine landscape paintings and accounts of flora and fauna to determine the impact of early British colonisation on the environment
	5	The nature of a convict or colonial settlement in Australia and how they changed the environment Investigate the impact of settlement on the environment (e.g. comparing the present and past landscape and the flora and fauna of the local community)
	7	How harmonious relationships with the natural world were reflected in Indian belief systems (for example Hinduism, Buddhism and Jainism) The nature of the (historical) sources for ancient Australia and what they reveal about Australia's past, such as the use of environmental resources
	8	The use of environmental resources in Shogunate Japan including forestry and land use policies and attempts to curb deforestation by imposing heavy regulations on farmers (S) Managing the harvesting of trees, and using lighter, efficient construction techniques (S) Genghis Khan's policies for banning the killing of animals in the breeding season (S) The way Polynesian societies used environmental resources (sustainably and unsustainably), including the extinction of the moa in New Zealand, as a result of hunting and habitat decline, the use of religious or supernatural threats (e.g. Rahui) to prohibit the collection of resources to ensure their sustainability, and the exploitation of Easter Island's palm trees (S)
	9	The impact of factories, mines and cities on the environment, and on population growth and distribution Sources that record the reactions of new arrivals to other countries (e.g. to the natural environment and climate)

Learning area	Year	Content examples
History (22) (7S)	10	Developments in technology, public health, longevity and standard of living during the twentieth century, and concern for the environment and sustainability (S) Growth in the world's population during the twentieth century, life expectancy changes in different parts of the world, and the depletion of natural resources Investigate a major global influence that has shaped Australian society e.g. environment movement **Whole elective on the history of the Environment movement since the 1960s and the emergence of the concept of sustainability (S)**
Science	F	How the materials used in buildings and shelters are suited to the local environment Daily and seasonal changes in our environment, including weather, affect everyday life
	1	Explore the local environment to identify natural, managed and constructed features Record short and longer term patterns of events that occur on Earth such as the weather Pose questions about events and features of the local environment that are of interest and affect students' lives People use science in their daily lives, including when caring for their environment and living things e.g. caring for plants and animals, animal habitats, and changing parks and gardens better to meet the needs of native animals (S) Use the senses to explore the local environment to pose interesting questions, make inferences and predictions
	2	Explore the local environment to observe a variety of materials, and describe ways in which materials are used Identify materials that can be changed, remade or recycled into new products eg paper(S) Describe everyday changes in our environment using knowledge of science People use science in their daily lives, to care for their environment and living things e.g. monitoring Earth's resources, rainfall, water levels and temperature (S) Managing and protecting resources, reducing waste and caring for water supplies (S) Many living things rely on resources that may be threatened, and science understanding can contribute to the preservation of such resources Use the senses to explore the local environment to pose interesting questions, make inferences and predictions
	3	How changes from solid to liquid and liquid to solid can help recycle materials (S) Make predictions about change and events in our environment and consider how posing questions helps plan for the future Science helps understand the effect of actions and how materials or pollutants affect the environment
	4	Recognise the interdependence of living things and that environmental factors can affect life cycles such as fire and seed germination Living things depend on each other and the environment to survive Physical properties of natural and processed materials influence their uses and can affect the management of waste or lead to pollution (e.g. plastics) (S) Science influences methods of waste management and knowledge of how waste affects the environment (S) Loss of habitat for living things and how human activity changes local environments Minimisation of the effects of erosion caused by human activity (S)
	5	Living things have structural features and adaptations to help them Scientific knowledge is used to inform decisions about … choice of heating fuels (S)
	6	The growth and survival of living things are affected by the physical conditions of their environment e.g. impacts of salt water, fertilisers and soil types on plant growth How reversible changes can be used to recycle materials (S) Sudden geological changes or extreme weather conditions can affect Earth's surface and living things e.g. the effect of drought, tsunamis, earthquakes Scientific understanding assists in natural disaster management to help minimise effects (S)

continued

Learning area	Year	Content examples
Science (66) (33S)	6	Whether an energy source is sustainable, and the use of solar panels (S) How moving air and water can turn turbines to generate electricity (S) How people from different cultures have used sustainable sources of energy e.g. water and solar power (S) Scientific understandings, discoveries and inventions are used to solve problems such as how to manage natural disasters, and to inform choices and decisions about our use of sustainable sources of energy, such as the use of electricity and the conservation of sources of energy (S) How electrical energy is generated in Australia and around the world, and the use of methane generators in Indonesia
	7	How human activity can affect local habitats and interactions between organisms, affecting food chains and food webs through: deforestation agriculture (e.g. palm oil harvesting in Sumatra and Borneo) introduction of new species (e.g. cane toads) and the use of fire by traditional Aboriginal people How human management of water impacts upon the water cycle (S) How water use and management relies on knowledge from different areas of science, and involves the application of technology (S) The contributions of Australian scientists to the study of human impact on environments and to local environmental management projects (S) How land management practices of ATSI peoples can help inform sustainable management of the environment (S) How traditional and Western scientific knowledge can be used in combination to care for Country (S)
	8	Science and technology contribute to finding solutions to a range of contemporary issues that may have an impact on other areas of society and involve ethical considerations e.g. recycling waste, how energy efficiency can reduce energy consumption, solar-powered vehicles, and maintaining the environment (i.e. bushland, a beach, a lake, a desert or a shoreline) (S) Technologies are applied to modern farming techniques to improve yields and sustainability (S) Aboriginal people recognise relationships in ecosystems by burning to promote new growth, attract animals and afford easier hunting and food gathering (S) People use understanding and skills from across the disciplines of science in their occupations, recognising the role of knowledge of the environment and ecosystems e.g. how engineers improve energy efficiency *(Transdisciplinary example)* (S)
	9	Examine factors that affect ecosystems consisting of interdependent organisms e.g. impact of seasonal changes, destruction of habitats, introduced species on population size, how ecosystems change as a result of events e.g. bushfires, drought, flooding How energy flows into and out of an ecosystem via the pathways of food webs, and how it must be replaced to maintain the sustainability of the system (S) Chemical reactions, including combustion, are important in both non-living and living systems and involve energy transfer How the products of combustion reactions affect the environment Respiration and photosynthesis and their role in biological processes How models can be used to predict changes in populations due to environmental changes, such as the impact of flooding or fire on rabbit or kangaroo populations Investigate how scientific and technological advances have been applied to minimising pollution from industry and how choices related to the use of fuels are influenced by environmental considerations (S) Use scientific knowledge to consider the impacts of human activity on an ecosystem from a range of different perspectives

Learning area	Year	Content examples
	10	The role of science in identifying and explaining the causes of climate change How human activity affects global systems The causes and effects of the greenhouse effect and the effect of climate change on sea levels and biodiversity, changes to permafrost and sea ice, and factors driving the deep ocean currents that regulate global climate, and their effects on marine life (S) How computer modelling has improved knowledge and predictability of phenomena such as climate change and atmospheric pollution (S) Evaluating claims relating to environmental footprints (S) Scientific developments, sustainable transport, low-emissions electrical generation (S) Technologies associated with the reduction of carbon pollution e.g. carbon capture (S) Innovative energy transfer devices, used in transport and communication (S) The use and control of CFCs based on scientific studies of atmospheric ozone (S)
Mathematics (7) (1S)	2	Determining the variety of birdlife in the playground
	3	Identify symmetry in the natural and built environment
	4	Taking no more than half the eggs from a nest to protect future bird populations (S)
	5	Posing questions about insect diversity in the playground, collecting data and observing the type and number of insects in the playground over time
	7	Using graphs of evaporation rates to explore water storage
	8	Plotting points for tables of values … such as water consumption over a month
	10	Investigating biodiversity changes in Australia since white settlement
Total: 101 of which 44S		
Note: (S) References relating specifically to environmental sustainability rather than just to the environment.		

From: English, History, Science, and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d and 2010e).

APPENDIX 62

Referred to in Chapter 11, Volume 1

Examples from the Science learning area in the Australian National Curriculum emphasising the importance of Science for environmental sustainability

Year	Science curriculum learning content and activity
2	People use Science in their daily lives, including when caring for their environment and living things e.g. monitoring Earth's resources, rainfall, water levels and temperature managing and protecting resources reducing waste and caring for water supplies Many living things rely on resources that may be threatened, and Science understanding can contribute to the preservation of such resources
3	Science helps understand the effect of actions and how materials or pollutants affect the environment
4	Science influences: methods of waste management and knowledge of how waste affects the environment discussions about loss of habitat for living things and knowledge of how human activity has changed the local environment and minimisation of the effects of erosion caused by human activity
6	Science can solve problems and inform choices about our use of sustainable sources of energy such as the use of electricity and the conservation of sources of energy and how to manage natural disasters
7	Science contributes to finding solutions to contemporary issues e.g. the use and management of water, recycling of greywater and blackwater, and ways to control the spread of the cane toad Science understanding influences the development of practices in areas such as industry, agriculture and marine and terrestrial resource management e.g. sorting waste materials, reducing pollution, and cleaning up oil spills, and treatment of water in industrial and household systems
8	Science and technology contribute to finding solutions to a range of contemporary issues that may have an impact on other areas of society and involve ethical considerations e.g. recycling waste, how energy efficiency can reduce energy consumption, solar-powered vehicles, and maintaining the environment (i.e. bushland, a beach, a lake, a desert or a shoreline) Technologies have been applied to modern farming techniques to improve yields and sustainability
9	Investigate how scientific and technological advances have been applied to minimising pollution from industry and how choices related to the use of fuels are influenced by environmental considerations Use scientific knowledge to consider the impacts of human activity on an ecosystem from a range of different perspectives
10	Consider the scientific knowledge used in discussions relating to climate change and evaluate claims relating to environmental footprints Scientific developments in areas such as sustainable transport and low-emissions electrical generation, require people working in a range of fields of Science, engineering and technology

From: Science learning area in the Australian National Curriculum (ACARA, 2010b).

APPENDIX 63

Referred to in Chapter 11, Volume 1

Comparison between ESD issues to inform curriculum content listed in Appendix 32 and ESD content in the Australian National Curriculum

Content in Australian National Curriculum From: (ACARA, 2010b, 2010c, 2010d and 2010e)	ESD Issues in Appendix 32 from various other sources
Human Rights (in History) Gender equality Indigenous peoples and their connection to, and care for Country	**Human Rights, Social justice and dignity** Gender equality, equity, solidarity Support for minorities, handicapped, marginalised Indigenous peoples and their habitat
Peace – Four references to International Day of Peace, peace treaties, UN peacekeeping efforts Caring for water supplies and waterways History of the migrant experience in Australia History of conflicts around the world	**Peace and Human Security** Peaceful coexistence, non-violence Food and water security Migration and settlement Conflict resolution
Health Public health, longevity, standard of living Indigenous health Link between wealth, education and health.	**Health** Eliminate hunger, malnutrition HIV/AIDS, malaria Intergenerational equity
Governance (history of in various societies) History of development of, or struggle for, democracy in various countries Citizenship for ATSI people, women, migrants Decision making skills dialogue only in texts Study of social systems and institutions in History Cooperation and collaboration in science Media literacy in English Use of ICTs Risks and hazards of scientific investigations	**Governance** Civics, democracy, active, responsible, participative citizenship, decision making, dialogue Community engagement, development, empowerment Social change, transparent, just social systems, and institutions Political systems Partnerships, cooperation Ethical use of power Eco-media, media literacy, ICTs Risk management
Cultural and Linguistic Diversity Mark of respect to acknowledge traditional custodians Religious tolerance of Ottomans Cultural and national identity Indigenous views of nature, land and relationships Diff worldviews, cultures, social systems in History	**Cultural and Linguistic Diversity** Respect for diversity Tolerance for difference Cultural identity, self-esteem Culturally diverse views of nature and society Social systems, sub systems and culture
Intercultural Understanding International Day of Peace, peace treaties, peacekeeping Religious tolerance of Ottomans History of conflicts around the world Various cultural influences in History Contributions of cultural knowledge to science	**Intercultural and Interfaith understanding** Peace, non-violence Tolerance, Resolution of difference Cultural exchange Cultural view of sacredness in the environment
Cultural heritage Conserving built heritage Use of Indigenous knowledge in Science	**Cultural heritage** Conserving cultural and linguistic diversity Local/traditional indigenous knowledge and cultural heritage
Cultural knowledge Indigenous knowledge of flora, fauna, fire, water Integrating traditional with modern technologies	**Cultural industries** Cultural tourism Economic development from sale of cultural goods Use of Indigenous knowledge of flora, fauna, and their sustainable agricultural practices and water use Integrating traditional and modern technologies

Natural heritage and resources Water sources, use, conservation, cycle, technologies Forces, renewable energies, solar system, solar power, fuels Effects of loss of biodiversity Land and soil erosion, deforestation Conserve/preserve/protect resources, water, energy Impact of human activity and disasters on ecosystems Study of living things, systems, habitats, life cycles, growth, change, evolution, biosphere Care of plants, animals, natural world, land, resources Plan and predict future Future use of science and technology Evaluating claims relating to environmental footprints Study of living systems and ecosystems Chemical sciences, structure of the earth	**Natural heritage and resources** Air and water quality, water technologies Forces, renewable energies, non renewable fuels, solar system Prevent environmental and land degradation Preserve/conserve natural resources, heritage, biodiversity Restore ecosystems, forests, habitats, fish stocks Living things, systems, natural life cycles, growth, change, evolution, Biosphere, Ecospace Care and stewardship of the natural world Sustainable futures Carrying capacity, ecological footprint Interspecies and intergenerational equity Map, monitor, assess living systems, ecological sustainability Biochemistry, structure of the earth How the environment shapes human activities Environmental citizenship and decision making
Climate change and scientific knowledge Effect of climate change on sea levels, biodiversity Causes/effects of greenhouse effect and carbon cycle Weather, climate, seasons, monitor temperature and rainfall Atmospheric and carbon pollution	**Climate change** Impacts of human activity on environment Weather and climate Seasons
Agriculture Effect of human activity on agriculture Influence of science on agriculture, land management Impact of plant cloning in agriculture horticulture fruit Impact of human activity on food chain and web Responses to rabbit plagues, cane toads in Australia	**Rural transformation** Minimise rural exodus Integrated pest management Agriculture and food production
Urban sustainability Factors that affect population sizes using statistics Atmospheric and carbon pollution, oil spills Reduce/manage waste, recycle materials, water, waste Sustainable habitats Materials used in buildings and shelters (1) Apply science to sustainable transport, low-emissions Sustainable electricity generation	**Sustainable urbanisation** Population growth Pollution: air, water, toxins Materials and waste management, reduction, recycling Sustainable habitat, food, water, air, sanitation Sustainable lifestyles Public infrastructure, built environment technologies Transport
Disaster management Natural disaster management, global disaster alerts	**Disaster management** Disaster prevention, preparedness, mitigation
Working life (and other miscellaneous topics) People moved to cities to find employment (History) Working conditions, pay during Industrial Revolution Working conditions and pay in Australia Topic on the Globalising World in History Rights of Indigenous People in History	**Poverty reduction** Eliminate poverty and suffering Employment (i.e. to reduce poverty) Socio-economic justice Effects of globalisation Improve quality of life for deprived and marginalised
Ethical practices Ethical use of science/technology Ethics/accuracy in research, data collection Ethics in organ transplantation, genetic engineering Risks/hazards of scientific investigations, safety	**Corporate responsibility and accountability** Ethical governance Transparent systems Environmentally and socially responsible development Intergenerational responsibility Ethical use of science and technology Limits to growth, impact of growth on environment Risk management Eco-efficiency, Life-cycle analysis Triple bottom line, cost-benefit analysis

Economy	Economic development - Market economy
Role of science in inventing useful products (plastic)	Materials for production/consumption
Science helps improve yields and sustainability	Economic organisation, systems, costs
Importance of science and technology to economies	Cultural goods and tourism
Sustainable use of resources	Integrate environmental concerns in social economic policy
Attitudes to land ownership in History.	Ecologically sustainable and appropriate development
	Natural capital and resource accounting
	Steady-state economy
	Ownership, value, property rights

From:

ACARA. 2010. The Australian National Curriculum for Science, History, Mathematics and English. (ACARA, 2010b, c, d and e)

Unesco IIS. 2004. *International Implementation Scheme for the United Nations Decade of Education for Sustainable Development (2005-2014).* Paris: Unesco.

Unesco Bangkok. 2005b. *A Situational Analysis of Education for Sustainable Development in the Asia Pacific Region.* Bangkok, Thailand: Unesco Asia and Pacific Regional Bureau for Education. (p. 4)

DEH. 2005. *Educating for a Sustainable Future. A National Environmental Education Statement for Australian Schools.* Melbourne: Curriculum Corporation. (pp. 9-17)

Commonwealth of Australia. 2010. *Sustainability Curriculum Framework. A guide for curriculum developers and policy makers.* Canberra: Department of Education, Employment and Workplace Relations. (pp. 13-35).

APPENDIX 64

Referred to in Chapters 11 and 13, Volume 1

References to socio-economic and socio-political issues
in the Australian National Curriculum

Learning area	Year level	Content examples
ECONOMIC ISSUES (socio-economic)		
English	Nil	
History	5	examine significant political and economic developments in the Australian colonies economic, political and social reasons for the establishment of British colonies in Australia explain the economic, social and political impact on an Australian colony of an event (e.g. impact of South Sea Islanders on sugar farming and timber industry)
	6	the contributions of migrants to Australia's economic and social development push and pull factors that contributed to people migrating to Australia (e.g. economic migrants) contribution of individuals and groups to the development of Australian society (e.g. economy) role of specific cultural groups in Australia's economic and social development (e.g. cattle industry, Snowy Mountains Scheme, pearling industry) the pay and working conditions of ATSI peoples, migrants and women in Australia
	8	how social, economic, religious, and political beliefs were often challenged and significantly changed in transition to the Modern world the social, cultural, economic, political features in Viking society, Medieval Europe, the Ottoman Empire, Renaissance Italy, the Khmer Empire, shogunate Japan, and in Polynesian (x7) longer-term effects of conquest and colonisation on the Indigenous populations of the Americas (e.g. unequal distribution of land and wealth) design a table to list sources and aspects of the past about which provide informationrmation (e.g. social structure, economy, governance) the Church's power in terms of its control of wealth and labour concentration of wealth and power in the Italian city-states reasons for Angkor's rise to prominence and wealth from trade and agriculture design a table to list sources and information about the past (e.g. social structure, economy, governance)
	9	emergence and nature of significant economic, social and political ideas in the Modern World key features (social, cultural, economic, political) of ONE Asian society World War I impacts on Australia's economy and society (e.g. steel industry in Newcastle) the effects on living and working conditions in Australia (i.e. housing, sanitation, transport, education, industry), of the gold rushes, the 1890s depression, World War I, and the introduction of social legislation for invalid and old-age pensions and maternity allowance, around the turn of the twentieth century the Industrial and Agricultural Revolutions in Britain and access to cheap labour, leading to the emergence of a wealthy middle class support for Chartism (i.e. labour movement) among the poorer classes as a response to deteriorating living and working conditions

APPENDIX 64 (continued)

Learning area	Year level	Content examples
History (32)	10	twentieth century a critical period in Australia's social, cultural, economic, political development the rising economic influence of China and India developments in technology, public health, longevity and standard of living during 20th century continued civil rights action for ATSI peoples in education, health and work
Science (2)	8	influence of science on industry, agriculture, horticulture and on modern farming techniques to improve yields and sustainability (S) investigating the role of science in the development of technology important to the economies and communities of the Asia-Pacific regions
Mathematics (2)	7	relationship between wealth or education and the health of populations from different countries (S)
	10	evaluating statistical reports comparing the life expectancy of Aboriginal and Torres Strait Islander people with that of the Australian population (S)

TOTAL: **ECONOMIC ISSUES – (36)**

SOCIAL ISSUES (socio-political)

Learning area	Year level	Content examples
English (2)	10	explain satirical events (e.g. depictions in political cartoons) (x2)
History (61)	2	identify place and street names in the local community and discover their origin and meaning (e.g. names linked to political, religious and social figures)
	5	economic, political, social reasons for establishing British colonies in Australia after 1800 the impact of the Eureka Stockade on the development of democracy in Australia role that a significant individual or group played in shaping a colony (e.g. political leaders) the development of self-government in Australia
	6	factors that led to Federation, and the British and American influences on Australia's system of law and government experiences of democracy and citizenship in Australia, for ATSI peoples, migrants and women comparing push-pull factors contributing to people migrating to Australia (e.g. political refugees)
	7	development of self-governing city-states in Greece
	8	how social, economic, religious, and political beliefs were often challenged and significantly changed in transition to the Modern world the social, cultural, economic, political features in Viking society, Medieval Europe, the Ottoman Empire, Renaissance Italy, the Khmer Empire, shogunate Japan, and in Polynesian society influence of government in Renaissance Italy city states (Naples monarchy, republic in Florence) Genghis Khan's use of policies for governing his empire (e.g. codifying laws, religious freedom) design a table to list sources and aspects of the past about which provide information (e.g. social structure, economy, governance) explain the longer-term effects of conquest and colonisation on the Indigenous populations of the Americas (e.g. political inequality)

Learning area	Year level	Content examples
History (61)	9	emergence and nature of significant political ideas in the Modern World (e.g. nationalism, capitalism, socialism, egalitarianism, imperialism, Chartism)
		key features (social, cultural, economic, political) of ONE Asian society
		how the French Revolution and American independence contributed to ideas of equality
		the invention of democratic values
		the emergence of a belief in social and political equality, including the right to vote, egalitarianism and universal education in Australia
		federation and the development of Australian self-government and democracy including women's voting rights, defence concerns, nationalist ideals, egalitarianism, the Westminster system
		Introduction of Federal Legislation in Australia 1901-1914 (e.g. Harvester Judgment, pensions, the Immigration Restriction Act)
		the rise of nationalist sentiment leading up to WW1 in the period 1750 – 1918
		government use of propaganda to influence the civilian population during WW1
		groups who opposed conscription to fight in WW1 and grounds for objections
		first and second referenda on conscription and political divisions over this issue
		the emergence of Japan as a major world power
	10	20th century a critical period in Australia's social, cultural, economic, political development
		transformation of the modern world during a time of political turmoil, global conflict and Australia's development in post World War II international cooperation, the UN and peacekeeping
		use of World War II wartime government controls - conscription, manpower controls, rationing, censorship
		significance of World War II to Australia's international relationships in the 20th century
		the impact of World War II on the emergence of the United States as a major world power and on Australia's alliance with the US
		achievement of independence by former colonies
		competing ideologies of capitalism and communism
		Cold war and post-Cold war conflicts
		US the world's last remaining superpower
		the rising political influence of China and India
		the struggle for democracy in Burma
		how views of men and women towards gender equality at different times in Australia reflect changing values and attitudes
		impact of changing government policies on Australia's migration patterns, including abolition of the White Australia Policy, 'Populate or Perish'
		responses of Australian governments and international organisations to environmental threats - international protocols and treaties such as Kyoto

Learning area	Year level	Content examples
(civic/political rights) (20)	6	the status and rights of ATSI, migrants, and women stories of individuals or groups who advocated or fought for rights in 20th century Australia the rights and status of women, ATSI peoples and the experiences of migrants
	7	the rights of women in Egypt (e.g. in marriage, family life, work and education) the rights of citizens in ancient Athens (e.g. the right to vote), their responsibilities (e.g. military service, attending assembly meetings) and the invention of freedom the rights and responsibilities of women in China (e.g. in marriage, family life, work, education)
	9	the development of women's voting rights in Australia
	10	struggles for human rights and freedoms and how rights and freedoms have been ignored, demanded or achieved in Australia and in the broader world context major movements for rights and freedom in the world (US Civil Rights, ATSI and women's movements) understanding the aims and motivations of the US Civil Rights movement Freedom Rides in the US, and how they inspired civil rights campaigners in Australia, and became a turning point in the ATSI peoples' struggle for rights and freedoms struggle of ATSI peoples for rights and freedoms (e.g. 1938 Day of Mourning, Stolen Generations) aims, tactics and outcomes of ATSI peoples' Civil rights struggles: 1962 right to vote 1967 Referendum Reconciliation Mabo decision Report Stolen Generations and Report the Apology methods used by civil rights activists to achieve change for ATSI peoples (1965 Freedom Ride) efficacy of television in bringing the struggle for rights and freedoms to national attention continuing nature of efforts to secure civil rights and freedoms in Australia and throughout the world, e.g. Declaration on Rights of Indigenous Peoples (2007), and struggle for democracy in Burma the focus for continued civil rights action for ATSI peoples (e.g. education, health, work) origins, significance and drafting of the Universal Declaration of Human Rights, including Australia's involvement in its development emergence of the concept of 'Rights of nature' in the 20th century recognising that humans and their natural environment are closely interrelated
Science	Nil	
Mathematics	Nil	

TOTAL: SOCIAL ISSUES – (63)

From: English, History, Science, and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d and 2010e).

APPENDIX 65

Referred to in Chapter 12, Volume 1

Values appearing most frequently in the Australian National Curriculum compared to those in the Melbourne Declaration, the NFVE and global values

Values in the National Curriculum	Fre-quency	Melbourne Declaration on Educational Goals for Young Australians	National Framework for Values Education	Global Values (See Table 6.1 in Chapter 6 and Appendix 18)
[1] share/exchange (e.g. ideas) dialogue 15 communication 97	45 (157)	communication	-	dialogue
[2] cultural/linguistic difference	93	respect for difference (i.e. social, cultural, religious, linguistic)	cultural understanding, respect, tolerance	diversity, respect
accurate/correct	44	-	-	integrity
[3] values	43	values	all values in framework	all are values
rights	34	-	-	global values based on human rights
cooperation collaboration	30	collaboration teamwork	-	cooperation
[4] participation	25	civic participation	-	participation
[2] diversity (including biodiversity)	24	respect for difference (social, cultural, religious, linguistic)	cultural understanding, respect, tolerance	respect diversity
[3] ethical	21	ethical integrity, honesty	-	integrity, honesty
freedom, liberation independence	19	-	freedom	freedom, liberty
[3] attitudes	18			
safety	18	-	-	security, safety
conserve, preserve protect	15	sustain, improve	-	protect, preserve
empathy	15	empathy	care, compassion	care
care, concern	15	empathy	care, compassion	care
[1] dialogue	(15)	communication	-	dialogue
independent	14	independent (learner)	-	-
equality(7), fairness (3) egalitarianism (4)	14	equity	fair go	equality, equity justice
democracy	12	democracy	-	democratic participation
appreciation	12	-	-	value diversity
identity	10	identity	-	-
[3] morals	8	moral/ethical integrity	-	-
quality	8	quality	doing your best	-
confidence	7	confident	-	-
citizenship	6	responsible citizens, participate in civic life	-	democratic participation
responsibility	6	collective/self-responsibility responsible citizens	responsibility	responsibility
creative	6	creative	-	creativity, innovation

continued

APPENDIX 65 (continued)

> **Notes:**
>
> 1 When 'sharing' and 'exchanging' ideas are combined with 'dialogue' and 'communication' this becomes the most frequent value with 157 references. Although 'communication' is a skill rather than a value, its frequency (i.e. 97 times) indicates that good communication is valued in the curriculum. 'Communication' also appears in the Melbourne Declaration, and 'dialogue' among global values.
>
> 2 Cultural and linguistic diversity and differences are not actually expressed as values in the National Curriculum, but differences are highlighted for awareness-raising.
>
> 3 References to the terms 'values', 'morals', attitudes and 'ethical' are included here, even though these are not values in themselves, but are important to include.
>
> 4 References to 'participation' in the curriculum refer to the participation of students in class discussion and activities, rather than to the meaning of 'democratic participation' as reflected in global values.
>
> 5 The global values of 'dignity', 'tolerance', 'peace', 'respect' and 'solidarity' are not among the values appearing most frequently in the curriculum.

From:

English, History, Science and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d, and 2010e).

DEST. 2005. *National Framework for Values Education in Australian Schools.* Canberra: Commonwealth of Australia

MCEECDYA. 2008. *The Melbourne Declaration on Educational Goals for Young Australians*. Melbourne: Curriculum Corporation.

APPENDIX 66

Referred to in Chapters 12 and 13, Volume 1

Full collation of values in the Australian National Curriculum

Year levels ↓	English	History	Science	Mathematics
Foundation to Year 2	Appreciate 2 Collaborative 1 Confidence 1 Correct/correctly/correctness 15 Cultural difference 8 Exchange 1 Fairness 1 Inclusion 1 Independent 4 Linguistic difference 10 Morals 2 (across cultures) Participation 10 Share 9 Validity 1	Appreciate 1 Correct 1 Cultural difference 6 Empathy 3 Identity 1 Respect 1 Responsibility 1 Safety 1 Share 1	Care for environment, living things 5 Cultural difference 3 Protect resources 1 Preserve resources 1 Conserve resources 1 Participate 2 Share 3 Value 1	Confidence 2 Cultural difference 1 Sharing 2
3 - 6	Aesthetic appreciation 4 Appreciate 2 Attitudes 2 Care (for others and the Earth) 3 Concern for welfare 1 Confidence 1 Cooperation 1 Collaborative 7 Correct/correctly/correctness 10 Creative 1 Cultural difference 14 Dialogue 8 Diversity 1+ Biodiversity 1 = 2 Empathy 3 Equal 2 Ethical (issues/dilemmas) 2 Inclusive 1 Independent 4 Linguistic difference 8	Attitudes 3 Care 2 Citizenship 6 Collaborative 1 Cultural difference 8 Democracy 8 Diversity 10 Empathy 4 Equality 1 Exchange 1 Identity 2 Independence 2 (political) Interconnectedness 1 Peace 1 Respect 1 Rights 3 Values 2	Accuracy 1 Appreciate 4 Collaboration 2 Conservation 2 Cultural difference 1 Safety 8 Share 8	Accuracy 1 Appreciate 1 Sharing 1 Correct 3 Cultural difference 2 Diversity 1

Year levels ↓	English	History	Science	Mathematics
3 - 6	Merit 2 Morals 1 Negotiation 2 Participation 8 Preservation (natural heritage) 1 Respect 1 Share 12 Values 1			
7 - 10	Aesthetic appreciation/appeal 12 Appreciate 2 Attitudes 6 Collaborative 3 Concern (local/global issues) 1 Confidence 3 Correct/correctly/correctness 1 Creative 5 Cultural difference 28 Dialogue 7 Diversity 1 Empathy 1 Ethical (issues/dilemmas) 11 Exchange 1 Freedom 1 Identity 4 Inclusive 1 Independent 5 Integrity 1 Interconnectedness 1 Judgments of good/bad/right/wrong 1 Linguistic difference 3 Love 1 Merit 1 Moral problems 5	Attitudes 14 Concern for environment 1 Conserving heritage and environmental resources 2 Cooperation 1 Democracy 4 Diversity 3 Egalitarianism 4 Empathy 4 Equality 3 Freedom 15 Frugality 1 (Japan) Gender equality 1 Honour 2 (Japan, Vikings) Humanism 1 Ideologies (e.g. capitalism) 1 Identity 3 Independence 2 (political) Justice 1 Liberation 1 (political) Loyalty 1 (Japan) Merit 1 Multiculturalism 1 Peace 3 Preservation (natural/cultural) 1 Protection (social) 2	Accuracy 10 Care 2 Collaboration 14 Conservation 4 Considerate treatment of animals 2 Diversity 3 + Biodiversity 3 = 6 Ethics/ethical actions in science/medicine 8 Equilibrium (in systems) 1 Fairness 2 Humane treatment of animals 2 Independent 1 Interdependence 3 Quality 8 Safety 9 Share 2 Validity 2 Values 2	Correct 2 Cultural difference 1 Biodiversity 1

Year levels ↓	English	History	Science	Mathematics
7 - 10	Negotiation 2 Participation 5 Rights and duties 1 Share 4 Validity 1 Values 12	Responsibility 5 Rights/Human rights 33 Security 1 Tolerance 2 Universal education 1 Values 25		
Frequency by learning area	Appreciation (6); Attitudes (8); Care (3) + Concern (2) = (5); Confidence (5); Cooperation (1)+ Collaborative (11) = (12); Correct (26); Creative (6); Cultural/linguistic difference (71); Dialogue (15); Diversity (2)+Bio-diversity (1) = (3); Empathy (4); Equality (2); Ethical (13); Freedom (1); Fairness (1); Identity (4); Inclusion (3); Independent (13); Integrity (1); Interconnectedness (1); Judgments of good/bad, right/wrong (1); Love (1); Merit (3); Morals (8); Negotiation (4); Participation (23); Preservation (1); Respect (1); Share/Exchange (27); Rights and duties (1); Validity (2); Values (13	Appreciation (1); Attitudes (17); Care (2)+Concern (1) = (3); Citizenship (6); Cultural difference (14); Conserving(2)+Preservation (1) = (3); Correct (1); Cooperation (1)+ Collaborative (1) = (2); Democracy (12); Diversity (13); Empathy (11); Equality (4)+ Egalitarianism(4) = (8); Freedom (15); Frugality (1); Gender equality (1); Honour (2); Humanism (1); Identity (6); Ideologies (1); Independence (2); Interconnectedness (1); Justice (1); Liberation (1); Loyalty (1); Merit (1); Multiculturalism (1); Peace (4); Protection (2); Respect (2); Rights (33); Responsibility (6); Safety (1); Security (1); Share/Exchange (2); Tolerance (2);Values (27)	Accuracy (11); Appreciate (4); Care (7); Conserve(7)+Protect(1)+ Preserve(1) = (9); Collaboration (16); Consideration (2); Cultural difference (4); Diversity(3)+ Biodiversity (3) = (6); Ethical (8); Equilibrium (1); Fairness (2); Humane (2); Independent (1); Interdependence (3); Participate (2); Quality (8); Safety (17); Share (13); Validity (2); Values (3).	Accuracy (1); Appreciate (1); Diversity (1) + Biodiversity (1) = (2); Confidence (2); Correct (5); Cultural difference (4); Sharing (3).
Frequency of values in alpha order	Accuracy(12)+Correct(32) = (44); Appreciation (12); [3]Attitudes (25); Care/concern (15); Confidence (7); Considerate (2); Cooperation/Collaboration (30); Citizenship (6); Conserve/Preserve/Protect (15); Creative (6); Democracy (12); Dialogue (15); [2]Diversity/Biodiversity (24); [2]Cultural/linguistic difference (93); Empathy (15); Equality/Egalitarianism (10); Equilibrium (1); [3]Ethical (21); Freedom/Independence/Liberation (19); Fairness (3); Frugality (1); Gender equality (1); [1]Honour (2); Humane (2); Humanism (1); Identity (10); Ideologies (1); Inclusion (3); Independent (14); Integrity (1); Interconnectedness (2); Interdependence (3); Judgments (1); Justice (1); Love (1); [1]Loyalty (1); Merit (4); [3]Morals (8); Multiculturalism (1); Negotiation (4); Participation (25); Peace (4); Respect (3); Quality (8); Rights (34); Responsibility (6); Safety (18); Security (1); Sharing/exchange (45); Tolerance (2); Universal education (1); Validity (4); [3]Values (43);			
Values in order of frequency	[2]Cultural/linguistic difference (93); Sharing/exchange (45); Accuracy/Correct (44); [3]Values (43); Rights (34); Correct (32); Cooperation/Collaboration (30); Participation (25); [2]Diversity/Biodiversity (24); §Ethical (21); Freedom/Independence/Liberation (19); [3]Attitudes (25); Safety (18); Conserve/Preserve/Protect (15); Empathy (15); Care/concern (15); Dialogue (15); Equality/Egalitarianism/Fairness (14); Independent (14); Democracy (12); Appreciation (12); Identity (10); [3]Morals (8); Quality (8); Confidence (7); Citizenship (6); Responsibility (6); Creative (6); Merit (4); Validity (4); Negotiation (4); Peace (4); Fairness (3); Inclusion (3); Respect (3); Interdependence (3); Considerate (2); [1]Honour (2); Humane (2); Interconnectedness (2); Tolerance (2); Equilibrium (1); Frugality (1); Gender equality (1); Humanism (1); [4]Ideologies (1); Integrity (1); Judgments (1); Justice (1); Love (1); [1]Loyalty (1); Security (1); Universal education (1); Multiculturalism (1);			
Notes	**1** The values of 'honour' and 'loyalty' are referred to only as examples of values in Japanese culture. **2** These are not actually values but were indicative of an emphasis on learning about difference. **3** These are not actually values but are related terms for them. **4** 'Ideologies' are not values. They represent belief systems that can, however, be informed by values.			
TOTALS	No. of Individual Values: **64** Total values references: **631**			

From: English, History, Science, and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d, 2010e).

APPENDIX 67

Referred to in Chapter 12, Volume 1

References to 'difference' in the Australian National Curriculum

Learning area	Year level	Content in learning areas
English	F	understand that … different languages may be spoken by family, classmates and community different languages exist various languages encountered at school or in community valuing ability to speak more than one language use a different tone and style of language with different people use different voice levels appropriate to a situation ask relevant questions and express requests and opinions in ways that suit different contexts sharing experiences of different texts and discussing some differences direction of print may differ in other cultures e.g. Japanese texts differences between imaginative and informative texts texts created by authors who tell stories and share experiences that are similar or different to students' own experiences
	1	people use different systems of communication for different needs and purposes (e.g. hearing or visually impaired) different ways of asking for information, making offers and giving commands different types of questions and the difference between questions and statements different ways of expressing emotions different interaction conventions similarities between texts from different cultural traditions differences in words that represent people, places and things similarities and differences between texts and different purposes of texts differences between imaginative informative and persuasive texts features of characters in different stories understanding that different cultures may approach listening, questioning, and body language differently different types of texts, literature, punctuation, sentences, words, images, questions, sounds and letters
	2	different modes of communication have different features different spoken, non-verbal, written and visual communication from ATSI communities and Asian cultures in Australia language varies with different roles in social and classroom interactions e.g. giving a presentation terms of address used to signal different kinds of relationships how language is used to present characters and settings in different ways compare versions of the same story by different authors or from different cultures, describing similarities and comparing differences in authors' points of view on a topic features of texts poems, chants, rhymes or songs from different cultures recite, sing or create interpretations of poems, chants, rhymes or songs from own and other different cultures tell known stories from a different point of view identify similarities and differences between texts on similar topics, by different authors, from different cultures how to comment on what others say e.g. 'I agree that', 'I have a different thought' adjusting presentation for different audiences different modes of communication, types of texts, diagrams, literary texts, purposes, points of view, audiences

continued

Learning area	Year level	Content in learning areas
English	3	languages have different written and visual communication systems and oral traditions a word or sign can carry different weight in different cultural contexts choice of adverbs, nouns and verbs present different evaluations of characters in texts different types of texts vary in use of language choices, depending on their function and purpose verbs represent different processes how different types of verbs add meaning to a sentence language and judgments might differ depending on the cultural context characters, events and settings are portrayed in different ways explore commonalities of experience or ideas, and different lifestyle and world view in ATSI or Asian literature specific speaking or listening skills of different group roles using language appropriately in different situations different texts, types of knowledge, language, meanings, types of illustrations and graphics, views, purposes
	4	use language differently with our friends and families language is adjusted in different contexts differences between the language of opinion and feeling and that of factual reporting or recording similarities and differences between print and digital information quoted (direct) and reported (indirect) speech in different types of text comparing similarities and differences how adverbials (adverbs and prepositional phrases) work in different ways how different authors may represent similar storylines, ideas and relationships how authors have established setting and period in different cultures and times different authors' treatment of similar themes and text patterns e.g. fables and allegories from different cultures commenting on 'How is this text similar to or different from other texts I've read?' viewing documentaries and news footage from different periods, comparing the style of presentation with contemporary texts on similar topics and tracking changing views on issues, e.g. war, race, gender differences between imaginative and informative texts understanding and taking account of different opinions and interpretations different types of texts, verbs, adverbials and noun groups, language
	5	how cultures differ in making and responding to common requests take account of differing perspectives and points of view words can have different meanings in different contexts variability within cultural contexts in literary texts, recognising the **diversity** of people's experiences within a cultural group such as differences in setting and lifestyle between urban and remote ATSI peoples ideas in literary texts conveyed from different viewpoints, leading to different interpretations and responses texts written from different narrative points of view use of language in comparing different things difference between main and subordinate clauses choose vocabulary and vocal effects appropriate for different audiences and purposes links between information and ideas from different sources to understand experiences, ideas and information beyond immediate experience different viewpoints, opinions, interpretations, purposes, audiences

APPENDIX 67 (continued)

Learning area	Year level	Content in learning areas
English	6	different social and geographical dialects or accents used in Australia, use different ones in different contexts identify and appreciate differences in language used in **diverse** family settings differentiate between reporting the facts and providing a commentary connections between own experiences and of characters in texts from different historical, social … contexts the influence that different historical, social and cultural experiences have on meaning made from texts and attitudes developed towards characters, actions and events effects of different ways of representing ideas and events creating informative texts for two different audiences … that explore an aspect of **biodiversity** different texts by different authors different audiences, purposes, points of view different uses of commas, tenses, texts, styles, narrator, narrative structure, voice, language style, different personal responses to texts
	7	local idioms and their meanings, accents and styles of speech for different contexts how different advertisements use visual elements to advertise the same product viewpoints about events, issues and characters in texts from different historical, social and cultural contexts identify and explain different points of view in texts e.g. different perspectives based on culture, gender or age identify areas of agreement and difference with others justifying a point of view research perspectives different from one's own deliver a presentation to promote a point of view or a new way of seeing use of language helps to create different identities e.g. teenagers, sportspeople different types of texts, narrative approaches, authorial choices, narrative structures, audiences and purposes
	8	how ideas and viewpoints in literary texts drawn from different historical, social and cultural contexts may reflect or challenge the values of others explain differing viewpoints in texts about ATSI history from different sources compare attitudes and ideas in texts drawn from contexts different to students' own explain differing viewpoints about the world, cultures, individual people and concerns represented in texts use evidence to support or challenge different perspectives use language conventions to suit different situations compare representations of different social groups in texts from different contexts e.g. swagman and homeless plan, rehearse and deliver presentations … to reflect a **diversity** of viewpoints differences in text types, sources, text modes and media, audiences, groups in society, viewpoints, perspectives, literary genres, different layers of meaning, effects of vocabulary choices
	9	using evaluative language in different ways how representations of people and culture in texts are drawn from different historical, social, cultural contexts reflect on representations of values in literature drawn from cultures and times different from students' own personal understanding of the world and human experience interpreted in literature from cultures and times different from the students' own different ways texts created by and about ATSI and Asian peoples represent people, places, things and issues how context shapes representation of particular cultures and how texts from different periods reveal differences in viewpoints about different cultures e.g. differences in portrayal of migrants in traditional/contemporary texts

Learning area	Year level	Content in learning areas
English	9	perspectives represented in texts from different times and places explore moral and ethical dimensions of an issue represented in different texts, and how these align or contradict with others' perspectives analyse differing representations on moral issues in texts and critically analyse a personal view of the issue reasons for how issues are debated and reported in the media in different countries e.g. whaling in Japan language and visual choices authors use to present information, opinions and perspectives in different texts differences between texts, parts of texts, media texts different authors, audiences and purposes, interpretations, perspectives, language, representations, different meanings for different groups
	10	personal understanding of the world and human experience interpreted in literature from cultures and times different from the students' own consider the similarities and differences in ethical positions across more than one culture as represented in text differences between media texts between spoken and written English different technological affordances, purposes, audiences, contexts, viewpoints, perspectives, stylistic effects, ways of referencing, choices in the representation of images and nuances, different historical, social and cultural contexts, interpretations and responses to texts, types of texts, text structures and language features, connotations of words
History	F	learn about own history and of their family including stories from different cultures and other parts of the world understand how the past is different from the present stories of the past differ depending on who is telling them identify different members of a family different structures of families and family groups today different forms of communication
	1	how the present is different from or similar to the past differences in family life and structures and how they've changed in the present compared with the past different types of family similarities and differences between students' families and those of other children different forms of communication events of personal significance may differ according to children's cultural backgrounds differences and similarities between students' daily lives and life during their parents' childhoods similarities and differences between objects of the present and the past
	2	different historical sources
	3	study of identity and **diversity** in both a local and broader context explore the historical features and **diversity** of their community contribution made by different groups and individuals in the community role that people of **diverse** backgrounds have played in the development and character of the local community **diverse** 'character' of the community today comparing the significance of national days in different countries similarities and differences between photos of specific locations in the past and the present information from different historical sources different points of view and meaning of celebrations from different perspectives e.g. Australia Day for ATSI peoples
	4	how societies interacted with newcomers, and how these experiences contributed to their cultural **diversity** the **diversity** and longevity of Australia's first peoples mapping the **diversity** of Aboriginal and Torres Strait Islander language groups in Australia the **diversity** and antiquity of Aboriginal and Torres Strait Islander peoples

Learning area	Year level	Content in learning areas
History	4	examining the differences between the totems of ATSI peoples networks of exchange between different groups of people different points of view, stories, thoughts or feelings about contact experiences and early penal life
	5	what life was like for different groups of people in the colonial period the daily life of the different inhabitants of colonial life in Australia creating 'what if' scenarios by constructing different outcomes for a key event a 1965 Australian history book may provide a different perspective to one published in 2010 similarities and/or differences in what sources of evidence reveal about the past different motives and experiences of groups in the past e.g. reasons people migrated to Australia and their **diverse** experiences the daily life experiences of different inhabitants of a convict or colonial settlement
	6	using historical terms and concepts such as '**diversity**' different questions elicit different kinds of answers (e.g. difference between open and closed questions) increasing cultural **diversity** of present day Australia similarities and/or differences in what sources of evidence reveal about the past identify different perspectives in different periods and contexts
	7	different approaches to historical investigation different sources of historical information differentiating between primary sources and secondary sources
	8	the roles and relationships of different groups in society different types of crime and punishment different theories about the Polynesian expansion across the Pacific the responses of different groups in society to the spread of the Back Death different meanings of particular terms and concepts when viewed in their historical context experimenting with different words, phrases or historical concepts, when drafting a question for a research focus compiling a list of different sources needed in an inquiry
	9	different perspectives on the relationship between Asia and the West relationship between events in different periods and places select different kinds of questions about the past to inform historical inquiry analyse different historical interpretations different accounts of an eighteenth-century journey to Australia variations in perspective lead to different historical interpretations develop a historical argument that identifies different possibilities in interpretation describe different points of view, values, attitudes and perspectives
	10	life expectancy changes in different parts of the world views of men and women at different times regarding gender equality in Australia and how these views reflect changing values and attitudes different accounts of the first 1957 rock 'n' roll tours of Australia and the different perspectives based on age develop a historical argument that identifies different possibilities in interpretation

continued

Learning area	Year level	Content in learning areas
History	10	development of Australia's culturally **diverse** society that biological systems need to remain **diverse*** and productive over time *(example of ecological diversity)* different points of view, values, attitudes and perspectives in sources different types of graphs, periods, and places, geographical locations, questions, historical interpretations
Science	F	use their senses to gather different types of information different forms of clothing used for different activities modify our behaviour and dress for different conditions, including examples from different cultures how different shaped and sized objects such as balls, blocks and tubes move how the movement of different living things depends on their size and shape
	1	identifying similarities and differences of familiar objects and phenomena living things live in different places where their needs are met exploring different habitats in the local environment different living things live in different places such as land and water how the shapes of objects made from different materials can be physically changed different ways to produce sound using familiar objects and actions how musical instruments can be used to produce different sounds how different light sources are used in daily life participate in different types of guided investigations discuss observations to see similarities and differences in results
	2	living things have predictable characteristics at different stages of development different materials can be combined for a particular purpose different parts of everyday objects are made from different materials how different strengths of pushes and pulls affect the movement of objects toys from different cultures that use the forces of push or pull how different cultures have made inks, pigments and paints participate in different types of guided investigations to explore and answer questions discussing observations to see similarities and differences in results certain materials have different uses
	3	understand a range of systems operating at different time and geographic scales recognise the range of different living things differences between living, once living and products of living things predict the effect of heat on different materials how materials affect the environment in different ways
	4	understand a range of systems operating at different time and geographic scales stages of life cycles of different living things how different human activities cause erosion of the Earth's surface effect of friction between different surfaces

Learning area	Year level	Content in learning areas
Science	5	understand a range of systems operating at different time and geographic scales solids, liquids and gases have different observable properties and behave in different ways investigating differences between solids, liquids and gases which change under different situations substances exist in different states refraction of light at the surfaces of different transparent materials different types of scientists who work in teams in space exploration considering different investigation methods similarities and differences in qualitative data physical differences between solids, liquids and gases
	6	understand a range of systems operating at different time and geographic scales how changes can be classified in different ways growth of fungi in different conditions different electrical conductors and insulators how people from different cultures have used sustainable sources of energy e.g. water and solar power different investigation methods identify similarities and differences in qualitative data different types of change in materials
	7	explore the **diversity** of life on Earth classification helps organise **diversity** - on the basis of similarities and differences describe **biodiversity** as a function of evolution differences within and between groups of organisms differences between pure substances and mixtures why different regions of the Earth experience different seasonal conditions effects of applying different forces to familiar objects different ideas used in the development of models of the solar system how water use and management relies on knowledge from different areas of science different scientific responses to the rabbit plagues in Australia differences between controlled, dependent and independent variables different types of graphical representation ways to classify organisms based on observable differences
	8	classify different forms of energy compare similar systems in different organisms different states of matter differences between elements, compounds and mixtures differences between chemical and physical changes rocks are a collection of different minerals role of forces and energy in the formation of different types of rocks energy appears in different forms and have various effects such as changes between different forms of energy

Learning area	Year level	Content in learning areas
Science	8	heat energy transfer between materials having different temperature changes between different forms of energy how developments in reproductive technologies rely on scientific knowledge from different areas of science differences between controlled, dependent and independent variables understanding different types of graphical representation structure and function of different types of cells differences between substances using the particle theory how different forms of energy cause change in simple systems the application of science can affect people in different ways
	9	classify different chemical reactions forms of energy can be transferred through different mediums impacts of human activity on an ecosystem from a range of different perspectives use their knowledge to pose different types of questions how different forms of energy can be transferred
	10	the theory of evolution by natural selection explains the **diversity** of living things the effect of climate change on sea levels and **biodiversity** considering the long-term effects of loss of **biodiversity** explore systems at different scales explore evidence for different theories different types of chemical reactions are used to produce a range of products and can occur at different rates products of different types of simple chemical reactions role of different sources of evidence how information technology can be applied to different areas of science exploration of space involve teams of specialists from the different branches of science
Mathematics	1	coins are different in other countries
	2	different ways of representing numbers difference between dividing a set of objects into three equal groups and into groups of three objects can be partitioned in different ways to demonstrate fractions use scales to determine whether the mass of different objects is more, less or the same comparing the usefulness of different data displays compare and order different shapes and objects
	3	illustrate different unit fractions similarities and differences between various student-generated data representations
	4	evaluating the appropriateness of different displays difference in scale on maps of cities in Australia and those in Indonesia different methods of collecting data different displays in illustrating data different methods for data collection

Learning area	Year level	Content in learning areas
	5	how time was and is measured in different Aboriginal Country interpret different data sets x2 comparing data representations for different data sets measure and construct different angles insect **diversity** in the playground
	6	properties of different sets of numbers efficiency of different strategies decimals and percentages as different representations of the same number x2 games of chance popular in different cultures data can be represented in different ways similarities and differences between different student-generated diagrams
	7	difference between prime and composite numbers quantities can be represented by different number types different views of prisms and solids different ways to produce the same transformational changes health of populations from different countries
	8	difference between population growth rates in Australia and Asia difference between profit and loss as a percentage of cost or selling price conclusions based on data may differ from those based on preferences and beliefs different cultural or social emphases on use of data.
	9	difference between direct and inverse proportion different strategies for simplifying expressions with indices
	10	different strategies for simplifying expressions with indices investigating data in different ways to make comparisons and draw conclusions investigating different techniques for finding a 'line of best fit' surface area and volume of a **diverse** range of prisms investigating **biodiversity** changes in Australia

From: English, History, Science and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d, and 2010e**).**

APPENDIX 68

Referred to in Chapter 12, Volume 1

Tally of global values in the Australian National Curriculum

Global Values (See Table 6.1 in Chapter 6 and Appendix 18)	Matching Values in the Australian National Curriculum	Frequency of global values
equality, equity	equality	7
responsibility	responsibility	6
participation	(not in the global sense of democratic participation)	-
cooperation	cooperation	2
dignity	-	-
freedom, liberty	freedom (mostly in History)	16
safety, security	safety (18), security (1)	19
peace, harmony	peace (4), harmony week (1)	5
preserve, protect	preserve (3), protect (3)	6
respect	respect	3
dialogue	(not in the global sense of dialogue for peace, harmony, understanding or agreement)	-
integrity, honesty	integrity	1
diversity	diversity	19
tolerance	tolerance	2
justice	justice	1
solidarity, unity	-	-
TOTAL references to global values in the Australian National Curriculum		87

From:
English, History, Science and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d, and 2010e).

APPENDIX 69

Referred to in Chapter 12, Volume 1

Instances of 'interdependence' and 'interconnectedness'
in the Australian National Curriculum

Learning area	Year level	Curriculum Content
English	8	explore the interconnectedness of Country and Place, People, Identity and Culture in texts including those by ATSI authors
History	4	investigating ATSI sense of the interconnectedness of Country/Place, People, Culture and Identity
Science	8	explore the organisation of body systems in terms of flows of matter between interdependent organs
	9	multi-cellular organisms rely on interdependent internal systems
	9	ecosystems consist of communities of interdependent organisms
Mathematics	nil	

From:

English, History, and Science learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, and 2010e).

APPENDIX 70

Referred to in Chapters 12 and 13, Volume 1

Summary of references to the terms 'values', 'morals', 'ethics' (or ethical), 'attitudes', 'principles' and 'beliefs' in the Australian National Curriculum

Learning area → Terms ↓	English	History	Science	Mathematics	Totals
Values	22	28	3	(31)^{1}	**53**
Morals	7	-	-	-	**7**
Ethics/Ethical	13	-	8	-	**21**
Attitudes	8	17	-	-	**25**
Principles	-	1	-	-	**1**
Total references	**50**	**46**	**11**	**0**	**107**
Beliefs ^{2}	7	27	-	1	35

Notes:

1 All references to 'values' in the Mathematics curriculum relate to number, place and currency value and are therefore not counted in the total.

2 References to 'beliefs' are listed here because they appear alongside values and attitudes in the curriculum, even though they ought to be differentiated. (See discussion in Chapter 4).

From:

English, History, Science, and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d and 2010e).

APPENDIX 71

Referred to in Chapter 12, Volume 1

Full collation of instances of the terms 'values', 'morals', 'ethics' (or ethical), 'attitudes', 'beliefs' and 'principles' in the Australian National Curriculum

Learning area	Year	Content in learning areas
ENGLISH		
Values (22)	F	valuing the ability to speak more than one language
	1	learning to value listening, questioning and positive body language
	3	recognising the value of others' contributions
	5	evaluating the relative value of information
	5	how own and others' viewpoints about texts are shaped by individual values and experiences
	6	all languages and dialects are of equal value
	7	discuss the aesthetic and social value of texts
	7	discuss and interpret ideas and concepts that other individuals and groups value
	8	Ideas and viewpoints in texts from different historical, social, cultural contexts may reflect or challenge the values of individuals and groups interpretations of texts are influenced by own knowledge, values and cultural assumptions exploring values in texts that are explained in terms of other values e.g. the relationship between beautiful and good, or good and happiness creating texts that express views and values other than students' own
	9	reflecting on representations of values (e.g. love, freedom, integrity) in literature drawn from cultures and times different from the students' own explore notions of literary value how socio-cultural values, attitudes and beliefs are conveyed in texts
	10	identifying appeals to shared cultural knowledge, values and beliefs people's evaluations of texts are influenced by their value systems analyse ethical positions on a current issue, including values and/or principles evaluating aspects (of texts) that are valued and that contain aesthetic qualities how socio-cultural values, attitudes and beliefs are presented in texts analyse implicit or explicit values, beliefs and assumptions in texts identify and explain values, attitudes and assumptions in texts
Morals (7)	2	explore moral and social dilemmas in stories and media texts e.g. right or wrong, fairness and unfairness, inclusion and exclusion discuss moral and teaching stories from varied cultures and compare their central messages
	3	explore texts that highlight issues and problems in making moral decisions
	8	explore texts that solve moral problems by considering consequences or rights and duties
	9	explore moral and ethical dimensions of an issue in different texts, and how these align or contradict with personal and others' perspectives analyse differing representations on moral issues in texts
	10	evaluate the social, moral and ethical positions represented in texts
Attitudes (8)	5	how new suffix forms reflect changing attitudes to gender e.g. 'policewoman', 'salesperson'
	6	influence that historical, social and cultural experiences have on attitudes to events
	8	compare attitudes and ideas in texts from contexts different to students' own how tone indicates attitude to the subject
	9	how socio-cultural values, attitudes and beliefs are conveyed in texts

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Learning area	Year	Content in learning areas
ENGLISH		
	10	how socio-cultural values, attitudes and beliefs are conveyed in texts explain values, attitudes and assumptions in texts logical arguments that address different viewpoints, attitudes and perspectives
Ethical (13)	5-8	ethical dilemmas within real-world and fantasy settings (x 4)
	7	exploring ethical issues in literary texts
	9-10	texts explore themes of ethical and global dilemmas in real-world and fictional settings (x 2) explore moral and ethical dimensions of issues in different texts create texts that represent personal belief systems e.g. statements of ethical judgements whether ethical judgments of good, bad, right or wrong are absolute or relative through consideration of texts evaluate the social, moral and ethical positions represented in texts analysing ethical positions on a current issue consider similarities and differences in ethical positions across cultures in text
Beliefs (7)	4	relevance of characters, actions and beliefs to their own time.
	5	how literature conveys information about culture, such as beliefs, traditions and customs
	9	how socio-cultural values, attitudes and beliefs are conveyed in texts
	10	identifying appeals to shared cultural knowledge, values and beliefs creating texts that represent personal belief systems how socio-cultural values, attitudes and beliefs are presented in texts identify and analyse implicit or explicit values, beliefs and assumptions in texts
Principles		Nil
HISTORY		
Values (28)	2	why a building of significance is valued
	6	language used in sources to identify values and attitudes e.g. new Australians, boat people examine sources to identify the views, attitudes and values expressed
	7	beliefs, values and practices of ancient Egyptians (x1), ancient Greece (x2), ancient Rome (x1), Chinese society (x2), Indian society (x2) = (8) significant beliefs and values associated with warfare in ancient Greece points of view, attitudes and values in primary and secondary sources the values and attitudes of a society that produced certain sayings identify meaning, point of view, values and attitudes from sources
	8	what key beliefs and values emerged and how they influenced societies points of view, attitudes and values in primary and secondary sources values and attitudes revealed by an individual source, and how they are broadly representative of the values and attitudes of the society using additional sources examine sources to identify and describe points of view, attitudes and values
	9	role of Classical models and theories on the invention of democratic values values and attitudes towards war in 1750 – 1918 (e.g. sense of adventure) different points of view, values, attitudes and perspectives in sources
	10	compare and contrast views on the values and beliefs of rock 'n' roll, film and TV across time changing beliefs and values that influenced Australian way of life how views on gender equality in Australia over time reflect changing values, attitudes reasons for different points of view, values, attitudes and perspectives in sources change and continuity over time in the actions, motives, values of others
Morals		Nil

Learning area	Year	Content in learning areas
HISTORY		
Attitudes (17)	5	examine sources to identify the views and attitudes represented
	6	language used in sources to identify values and attitudes examine sources to identify the views and attitudes represented
	7	points of view, attitudes and values in primary and secondary sources the values and attitudes of a society that produced certain sayings identify meaning, point of view, values and attitudes from sources
	8	points of view, attitudes and values in primary and secondary sources values and attitudes revealed by an individual source, and how they are broadly representative of the values and attitudes of the society using additional sources examine sources to identify and describe points of view, attitudes and values
	9	attitudes towards the Chinese as revealed in cartoons in nineteenth century Australia values and attitudes towards war in 1750 – 1918 (e.g. sense of adventure) sources useful in revealing past prevailing attitudes different points of view, values, attitudes and perspectives in sources
	10	sources useful in revealing past prevailing attitudes how views on gender equality in Australia over time reflect changing values, attitudes reasons for different points of view, values, attitudes and perspectives in sources
Ethical		Nil
Beliefs (27)	6	cultural practices related to family life, beliefs and customs of newly-arrived migrants
	7	key beliefs of the major religions and philosophies that emerged in the ancient world significant beliefs, values and practices of the ancient Egyptians beliefs associated with Egyptian death and funerary customs (e.g. belief in afterlife) significant beliefs, values and practices of the ancient Greeks (x2) beliefs and values associated with Greek warfare beliefs, values and practices of the ancient Romans and beliefs associated with daily life (x2) influence of foreign cults on Roman religious beliefs and practices the rise of the roman empire and the spread of religious beliefs significant beliefs, values and practices of Chinese society (x2) the rise of Imperial China and the spread of philosophies and beliefs harmonious relationships with the natural world reflected in Indian belief systems significant beliefs, values and practices of Indian society (x2) the rise of the Mauryan Empire and the spread of philosophies and beliefs
	8	key beliefs and values that merged in the modern period describing beliefs about the world and the voyages of discovery religious beliefs in the 14th century including beliefs about the power of God (x2) Pre-Columbian life in the Americas, including beliefs (x2)
	9	the emergence of a belief in social and political equality.
	10	views on the values and beliefs of rock 'n' roll, film and television across time, age and gender changing beliefs and values that have influenced the Australian way of life
Principles (1)	4	investigate ATSI principles e.g. caring for country, for each other and respecting all things
SCIENCE		
Values (3)	1	value counting as a means of comparing observations
	9	the values of contemporary society can influence the focus of scientific research
	10	the values of contemporary society can influence the focus of scientific research
Morals and Attitudes - Nil		

Learning area	Year	Content in learning areas
SCIENCE		
Ethical (8)	7	**scientific solutions may involve ethical considerations** **conduct experiments ensuring safety and ethical guidelines are followed**
	8	**scientific solutions may involve ethical considerations** **ethical issues that arise from organ transplantation** **conduct experiments ensuring safety and ethical guidelines are followed**
	9	**address ethical issues associated with investigation methods**
	10	**address ethical issues associated with investigation methods** **when undertaking investigations take into account the need for accuracy, safety, fairness, ethical actions and collaboration**
Beliefs and Principles - Nil		
MATHEMATICS		
Values (31) *(i.e. applied to number or currency)*	F-3	number and place value (x5) Australian notes and coins according to their value x4 coins having the same value (x2) identify equivalent values in collections of coins or notes place-value patterns data value place value blocks apply place value to partition represent money values in multiple ways (x2)
	4	number and place value extend place value to decimals apply place value to partition place-value pattern place value system (x2) data value (x2)
	5	number and place value (x2) the value of a unit fraction value of the fraction
	6	number and place value
	7	number and place value substituting a given value for each variable a table of integer values
	8	number and place value data values plotting points for tables of values from non-rule-based data
	9	tables of values and graphs
	10	substitute values into formulas finding the five-number summary (minimum and maximum values, median and upper and lower quartiles) expand and factorise monic quadratic expressions and find unknown values
Morals, Attitudes, Ethical, Principles - Nil		
Beliefs (1)	8	drawing conclusions based on data differ from those based on preferences and beliefs

From:

English, History, and Science learning areas in the Australian National Curriculum

(ACARA, 2010b, 2010c, and 2010e).

APPENDIX 72

Referred to in Chapters 11 and 13, Volume 1

**Frequency of references relating to each ESD dimension
in the Australian National Curriculum**

Learning area -→ Sustainability dimension ↓	English	History	Science	Mathematics	Totals
[1] Cultural (See Appendixes 41, 42, 43 and Table 9.1, Chapter 9)	94 (1)	70 (9)	19 (4)	19 (4)	202 (18) **220**
[2] Social (See Appendix 64)	2	61	0	0	**63** (0)
[3] Economic (See Appendix 64)	0	32	0 (2)	0 (2)	32 (4) **36**
Environmental Environmental issues Environmental Sustainability (See Appendix 61)	3 (3)	15 (7)	33 (33)	6 (1)	57 (44) **101**
Totals	**103**	**194**	**91**	**32**	**420** **S(66)**

Notes: The bracketed ( ) numbers represent references relating to sustainability in each dimension.

1 The Cultural dimension of sustainability refers to the maintenance of diverse cultural practices, beliefs and languages, and the fostering of mutual respect, tolerance, understanding, and harmony among cultures, summarised in Table 9.1, Chapter 9.
2 The Social dimension of sustainability refers to stable governance, democratic participation, civil and legal rights, citizenship, universal franchise, and the ability to participate actively in all aspects of civic life.
3 The Economic dimension of sustainability refers to social and economic justice, having basic needs met (i.e. food, shelter, clean water, education, housing, health, employment), reducing poverty, trade and economic development.

From:
English, History, Science, and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d, and 2010e).

APPENDIX 73

Referred to in Chapter 13, Volume 1

References to cross-disciplinary cooperation in the Science curriculum

Year level	Cross-disciplinary references in the Science curriculum (13)
7	Science knowledge can develop through collaboration and connecting ideas across the disciplines of Science considering how water use and management relies on knowledge from different areas of Science, and involves the application of technology (S) recognising that traditional and Western scientific knowledge can be used in combination to care for Country and Place (S) People use understanding and skills from across the disciplines of science in their occupations
8	Science knowledge can develop through collaboration and connecting ideas across the disciplines of Science how knowledge of the location and extraction of mineral resources relies on expertise from across the disciplines of science considering how advances in technology, combined with scientific understanding of the functioning of body systems, has enabled medical science to replace or repair organs researching the use of reproductive technologies and how developments in this field rely on scientific knowledge from different areas of science People use understanding and skills from across the disciplines of science in their occupations recognising the role of knowledge of the environment and ecosystems in a number of occupations (S)
10	considering how information technology can be applied to different areas of science such as bioinformatics and the Square Kilometre Array the study of the universe and the exploration of space involve teams of specialists from the different branches of science, engineering and technology scientific developments in areas such as sustainable transport and low-emissions electrical generation require people working in a range of fields of Science, engineering and technology (S)

From:
Science learning area in the Australian National Curriculum (ACARA, 2010b).

APPENDIX 74

Referred to in Chapter 13, Volume 1

Opportunities to develop emotional intelligence in

the Australian National Curriculum

Learning area	Year level	Curriculum content in the learning areas
English	F	how we can use speech, gesture, writing and media to communicate feelings how emotions and feelings can be conveyed … by visual representations discussing how students feel about what happens in stories share feelings and thoughts about the events and characters in texts discussing how students feel about what happens in stories making an inference about a character's feelings
	1	extending students' vocabularies for the expression of feelings and emotions making inferences about characters' feelings and motives explore different ways of expressing emotions signal sentences that … express emotion
	2	exploring how language is used to express feelings including learning vocabulary to express a gradation of feeling, for example 'happy', 'joyful', 'pleased', 'contented' connecting the feelings and behaviours of animals in anthropomorphic stories with human emotions and relationships
	3	exploring the use of sensing verbs and how they allow readers to know what characters think and feel exploring examples of language which demonstrate a range of feelings speculating on what other characters might think or feel (x2) making considered inferences taking into account topic knowledge or a character's likely actions and feelings
	4	understand differences between the language of opinion and feeling adjectival use and how it engages us emotionally how the author makes us care about their decisions
	5	select specific vocabulary … to convey emotions discussing the impact of first person narration on empathy and engagement (x2) examining the narrative voice in ATSI texts which include perspectives about … how we should care for the Earth
	6	understanding when it is appropriate to share feelings and opinions examining different works by an author who specialises in humour or pathos to identify strategies such as exaggeration and character embarrassment to amuse and to offer insights into characters' feelings, so building empathy with their points of view and concern for their welfare how vocabulary choices … can express shades of meaning, feeling and opinion using sensory language to convey a vivid picture of places, feelings and events how language choice and imagery build emotional connection and engagement with the story inspire and/or emotionally engage … audiences

continued

Learning area	Year level	Curriculum content in the learning areas
English (38)	7	select appropriate vocabulary to show shades of meaning, feeling and opinion building a knowledge base about … words to express emotional responses to texts compare ways that language and images are used … to influence emotions in texts inferring the tone and emotional intent of a character in narrative
	9	how language devices may also influence the emotional responses of listeners or readers construct plot and create emotional responses
	10	how 'voice' as a literary device can be used … to evoke particular emotional responses creating … texts that compel readers to empathise with the ideas and emotions expressed engage audiences and generate aesthetic and emotional appeal explore social issues of global and local concern
History (13)	4	exploring stories about … early penal life to discover the thoughts or feelings of the people at that time
	5	identify … the feelings and motivations of individuals and groups (at particular times in history)
	F-10	develop historical understanding through key concepts including … empathy and significance (x11)
Science (7)	1	how science knowledge is used in the care of the local environment People use science … when caring for their environment and living things (x2) How Science is used in caring for plants and animals
	2	reducing waste and caring for water supplies
	7	how traditional and Western scientific knowledge can be used in combination to care for Country and Place how ATSI knowledge is being used to …e.g. take care of waterways
Mathematics	Nil	

From:

English, History and Science learning areas in the Australian National Curriculum

(ACARA, 2010b, 2010c and 2010e).

APPENDIX 75

Referred to in Chapter 13, Volume 1

References to aesthetic appreciation in the English learning area
in the Australian National Curriculum

Learning area	Year level	Curriculum content in the learning area
English	4,5,6,7, 8,9,10	listen to, read, view and interpret spoken, written and multimodal texts in which the primary purpose is aesthetic (x7)
	6	how authors innovate on text structures … achieve particular aesthetic … effects
	7	appreciation of the aesthetic qualities of text discuss aesthetic and social value of texts
	8	enable new understanding and appreciation of aesthetic qualities
	9	selecting content … for aesthetic and playful purposes
	10	evaluating aspects (of texts) that are valued and that contain aesthetic qualities creating texts … which have a personal aesthetic appeal reflect on the authors who have influenced students' own aesthetic style construct texts … to generate aesthetic and emotional appeal

From:

The English learning area in the Australian National Curriculum (ACARA, 2010e).

APPENDIX 76

Referred to in Chapter 13, Volume 1

Opportunities for civic contribution or action towards sustainability in the Australian National Curriculum

Learning area	Year level	Curriculum content in the learning area
English	5	Explaining how the features of a text advocating community action, for example action on a local area preservation issue, are used to meet the purpose of the text
	6	Creating informative texts for two different audiences, such as a visiting academic and a Year 3 class, that explore an aspect of biodiversity
	9	Presenting arguments that advance opinions, justify positions, and make judgments in order to persuade others about issues such as the importance of maintaining balance in the biosphere
Science	1	suggesting changes to parks and gardens to better meet the needs of native animals
	2	monitoring information about the environment and Earth's resources, such as rainfall, water levels and temperature

From:
The English and Science learning areas in the Australian National Curriculum (ACARA, 2010b and e).

APPENDIX 77

Referred to in Chapter 13, Volume 1

References to religion or spirituality in the Australian National Curriculum

Learning area	Year level	Curriculum content in the learning area
English	1	how spiritual beings are represented in ATSI stories
History	F	making a calendar of commemorative events … e.g. religious festivals (such as Easter, Ramadan, Buddha day, feast of Passover) retelling a story about a significant event such as … weddings, christenings, religious festivals
	1	identifying dates and changes that have personal significance (e.g. religious and school holidays)
	2	the importance today of an historical site of cultural or spiritual significance identifying place and street names … and discovering their origin and meaning (e.g. names that are linked to … religious and social figures)
	3	explaining the relationship between language, country, place and spirituality using local sites … to identify the cultural groups within the local community and their influence over time (e.g. as reflected in … religious buildings)
	5	the role that a significant individual or group played in shaping a colony e.g. religious and political leaders
	7	key features of ancient societies (farming, trade, social classes, religion) identifying the major religions/philosophies that emerged by the end of the period (Hinduism, Judaism, Buddhism, Confucianism, Christianity, Islam), and their beliefs the influence of law and religion in Ancient Egyptian/Athenian/Spartan/ancient Roman/Chinese/Indian society (x6) evidence of household religion and practices in Ancient Rome the influence of foreign cults on Roman religious beliefs and practices contacts between Rome and Asian societies … and the spread of religious beliefs
	8	social, economic, religious, and political beliefs of various societies the key role of gods … in Viking religion and the adoption of Christianity during the Viking period the religious nature of illuminated manuscripts policy of religious tolerance of Ottoman Empire use of religious/supernatural threats to conserve resources by Polynesian societies Genghis Khan's support for religious freedom religious beliefs in the 14th century, including medical knowledge and beliefs about the power of God e.g. that diseases were a punishment of God
	9	how religious groups responded to the ideas in Charles Darwin's 1859 book On the Origin of Species

From:

The English and History learning areas in the Australian National Curriculum (ACARA, 2010c and e).

APPENDIX 78

Referred to in Chapter 13, Volume 1

References to relationships in the Australian National Curriculum

Learning area	Year level	Curriculum content in the learning areas
English	F	language varies according to the relationships between people
	2	how terms of address are used to signal different kinds of relationships connecting the feelings and behaviours of animals in anthropomorphic stories with human emotions and relationships
	3	the relationship between characters can be depicted in illustrations, including power relationships how images construct a relationship with the viewer
	4	how different authors represent similar storylines, ideas and relationships changing relationships of characters in texts
	5 5/6/7/8/9/10	patterns of language help to signal social roles and relationships texts explore themes of interpersonal relationships in real-world and fantasy settings (x6)
	8	researching subject matter on social issues and/or relationships
	9	relationships are developed and through language and interpersonal skills
History	F	the relationship between family members
	1	kinship relationships and family structures in ATSI societies
	4	ATSI relationship with the land
	8	relationships between different groups in society
	10	Australia's international relationships
Science	-	no examples of interpersonal relationships
Mathematics	6	diagrammatic representations of kinship relationships of Central and Western Desert people.

From:
English, History, Science and Mathematics learning areas in the Australian National Curriculum (ACARA, 2010b, 2010c, 2010d and 2010e).

APPENDIX 79

Referred to in Chapters 13 and 14, Volume 1

**Summary evaluation of the Australian National Curriculum
against the evaluative criteria for values-based ESD in Appendix 40**

Criteria for values-based ESD	Summarised comments regarding the Australian National Curriculum against the evaluative criteria for values-based ESD
Values-based	No evidence of a systematic approach to integrating values explicitly across the curriculum, instead values appear haphazardly in passing references, or referred to generically with attitudes, beliefs, morals and ethics. No evidence of attempts to integrate in the curriculum, the values set out in the Melbourne Declaration, or the National Framework for Values Education. The frequency of values is generally low but particularly for global values, the most frequent being 'diversity', 'safety' (in Science experiments), 'freedom' (in History). Since values are not included in the curriculum achievement standards, they are unlikely to be assessed. The modelling by teachers and across the school of values in relationships and learning environments is not evident. There are learning activities for exploring, comparing and contrasting diverse attitudes and perspectives, which are useful, but it is unlikely that this method alone would be sufficient for enabling learners to continue evolving their values autonomously throughout life.
Whole school approach	There is no evidence in the curriculum of the need for teachers and schools to model or teach values or sustainable practices across the whole school. This is left to schools and State systems to address.
Whole person lifelong learning	No evidence of systematic attempts to address whole person learning. Focus primarily on cognitive learning, with some (but insufficient) practical, action-based learning, and no evidence of spiritual development. Examples of some socio-emotional learning activities, including communication, interaction, cooperation, relating well to others, aesthetic understanding, and expressing thoughts, opinions and feelings, but little focus on developing personal qualities, attributes and life skills. The development of positive self-esteem is not explicitly addressed, but this may to some extent depend on positive learning environments and relationships.
Transformative	No evidence of attempts to transform individual values, attitudes, behaviours, and lifestyles, nor transforming education and school contexts. Focus on awareness and understanding diverse attitudes and perspectives. No evidence of building skills for practical action to enable learners to bring about positive change.
Experiential	Some evidence of practical learning in scientific experiments, and making models in Science and Mathematics, but inadequate practical application of sustainability knowledge and skills, and few out of class activities evident.
Civic responsibility	References to assuming civic responsibility for taking positive societal or environmental action almost non-existent. Although the curriculum seeks to inform learners about a wide range of environmental issues, some cultural, and almost no socio-economic issues, they are not empowered to contribute positively in action.

continued

Criteria for values-based ESD	Summarised comments regarding the Australian National Curriculum against the evaluative criteria for values-based ESD
Participative	A strength area in the curriculum, with many opportunities for learners to interact and participate in cooperative group learning, enabling student voice, engaging in democratic decision-making, and expressing opinions, but no conflict resolution processes, only the study of societal conflicts in History.
Relevant and contextual	Many learning activities are personally relevant, and locally contextualised, emphasising issues relevant to the Australian context, but insufficient links are made in the curriculum to global concerns.
Learner-centred	Insufficient information available to assess all aspects of this criterion, some of which may be dependent on individual teachers and schools, but there is evidence to suggest that learner differences are accommodated, and feedback from the school trials indicate that expected learning is, for the most part, age-appropriate. There is evidence that learners are able to select some topics of study and that learning is personally and locally relevant. The scaffolding of certain skills and knowledge may enable autonomous, lifelong learning, some of which are relevant to sustainability.
Integrated, Multi-dimensional, Trans-disciplinary	The learning content does not cover all sustainability dimensions (i.e. socio-political, cultural, economic, environmental), but focussed primarily on environmental and socio-cultural issues, not necessarily connected to sustainability, nor to each other. Although the study of various systems is covered in the curriculum, neither systems thinking, nor systems approaches to teaching sustainability are addressed. While there are several examples provided of inter-disciplinary scientific and technological cooperation, opportunities for cross-disciplinary understandings are not provided. Attempts to integrate sustainability across the curriculum are fragmented and unevenly distributed across learning areas and year levels.
Inquiry-based	A strength area in the curriculum with many opportunities to investigate and analyse theoretical or real-life issues, not necessarily related to sustainability, requiring some critical thinking, reflection, problem solving and decision making, and a few instances of questioning claims made in media advertising. There are limited examples of divergent or innovative thinking, but many opportunities to create texts. There is little evidence of opportunities for learners to engage in systems thinking.
Futures perspectives	There are few opportunities for engaging in long-term futures thinking, or to envision possibilities and solutions for sustainable futures.
Positive learning environments	The fostering of positive learning environments is left to teachers, schools and education systems to address.
Multi-method Multi-sourced Quality learning	The choice of teaching methods is also left to teacher professional judgment. Opportunities for learning outside the classroom appeared to be limited, but this also is determined largely by context. There are opportunities for sourcing learning from multiple sources including from Indigenous people, guest speakers, and the internet.

From:
English, History, Science, and Mathematics learning areas in the Australian National Curriculum.
(ACARA, 2010b, c, d and e).

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