United Nations
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Cultural Organization

Education for Sustainable Development

An Expert Review of Processes and Learning

DESD Monitoring and Evaluation

Education for Sustainable Development

An Expert Review of Processes and Learning

Prof. Daniella Tilbury (University of Gloucestershire, United Kingdom) is the author of this publication commissioned by UNESCO.

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Preface

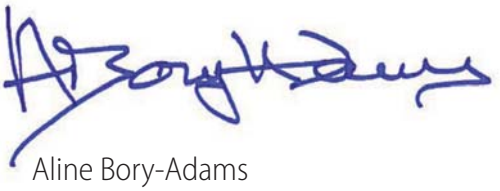
Monitoring and evaluation (M&E) is an integral part of education programme planning and implementation. M&E provides stakeholders, programme managers, government officials, and civil society with the means for improving implementation of programmatic activities, demonstrating results, learning from past experience, planning and allocating resources.

The United Nations Decade of Education for Sustainable Development (DESD, 2005-2014) is an endeavor that aims to reorient education policy, practice and investment to address sustainability. As the lead agency for the Decade, UNESCO is responsible for ensuring that appropriate mechanisms are in place to optimize the implementation of the Decade. To this end, UNESCO has put in place a three-phase monitoring and evaluation process that spans the life of the Decade complete with relevant methodologies and indicators.

In keeping with the focus and within the framework of Phase II of the Monitoring and Evaluation process, UNESCO has commissioned this expert review on processes and learning for Education for Sustainable Development.

This publication endeavors to identify which commonly accepted learning processes are aligned with ESD and should be promoted through ESD-related programmes and activities. It also seeks to examine which learning opportunities contribute to sustainable development.

I hope that this well researched and reader-friendly publication will contribute to develop a better understanding of the nature of ESD and help stakeholders to make the Decade of Education for Sustainable Development a success.



Aline Bory-Adams
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Acknowledgements

The expert review of processes and learning for Education for Sustainable Development (ESD) is one of the key documents within the framework of Phase II of the Decade of Education for Sustainable Development (DESD)-related monitoring and evaluation process.

We extend our appreciation and thanks to Prof. Daniella Tilbury, Chair, DESD Monitoring and Evaluation Expert Group (MEEG) for preparing this insightful and analytical review. We would particularly like to commend her unstinting commitment to prepare this review under extremely tight deadlines and to present it in a lucid and reader-friendly manner to facilitate a wide readership.

Thanks are also due to the other members of the MEEG: Abelardo Brenes, Rangachar Govinda, Alex Michalos, Yoshiyuki Nagata, Roël van Raaij, Overson Shumba, Konai Thaman, Pierre Varcher and Alcyone Vasconcelos, for their invaluable comments to finalize this review.

We also extend our appreciation to the various stakeholders, partners and actors who have contributed to the expert review by providing case studies to substantiate the theoretical perspective.

We extend our gratitude to the Japanese government for providing the financial support through the Japanese-Funds-In-Trust (JFIT) to the DESD monitoring and evaluation process.

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Executive summary

The United Nations Decade in Education for Sustainable Development (DESD, 2005-2014) is a global movement which seeks to transform education policy, investment and practice. If it is successful, the DESD could change not only education but also the quality of life for many people across the globe. Acknowledging the potential impact of the DESD, UNESCO established a Monitoring and Evaluation Expert Group (MEEG) in 2007. This expert review was commissioned as part of Phase II of the Global Monitoring and Evaluation effort for the DESD.

A key objective of this expert review is to gather information to inform the choice of tools and the specific questions which need to be asked as part of the 2011 DESD monitoring and evaluation report. The review seeks clarification on:

i) Which commonly accepted learning processes are aligned with ESD and should be promoted through ESD activities?

ii) What are ESD and related learning opportunities contributing to sustainable development?

ESD learning frameworks and processes

The review has identified that certain key processes underpin ESD frameworks and practices. These include:

- processes of collaboration and dialogue (including multi-stakeholder and intercultural dialogue);
- processes which engage the 'whole system';
- processes which innovate curriculum as well as teaching and learning experiences; and,
- processes of active and participatory learning.

'Learning' for ESD refers to what has been learnt and is learned by those engaged in ESD, including learners, facilitators, coordinators as well as funders. Often learning is interpreted as the gaining of knowledge, values and theories related to sustainable development but, as this review indicates, that ESD learning also refers to:

- learning to ask critical questions;
- learning to clarify one's own values;
- learning to envision more positive and sustainable futures;
- learning to think systemically;
- learning to respond through applied learning; and,
- learning to explore the dialectic between tradition and innovation.

The information provided by this review can be used to map where ESD is taking place across the globe, by assessing the content and processes underpinning such initiatives. There is often a tendency to map issues covered by ESD initiatives when in fact, there is also a need to review the processes underpinning these activities.

One critical lesson learnt through the review process is that it is difficult to access data on ESD processes and learning opportunities as these are rarely documented in sufficient detail in the literature. There is an abundance of information available about the specific objectives and outcomes of projects, but a noticeable lack of data to show how these objectives and outcomes are achieved. This relatively new field is only at the very earliest stages of generating the type of comparative and evaluative overview that provides a picture of effective processes and approaches. The study thus recommends that during Phase II i) data collection processes focus on actual experiences rather than reviews of the literature; and ii) data collection tools are based on tightly-focused questions that will capture greater detail about learning processes and learning opportunities.

One critical question remains at the core of the present review, which relates to the extent and the depth of connection between the choice of processes in ESD initiatives and actual contributions to sustainable development. In other words, is there a direct relationship between processes and outcomes in ESD? Given that the level of evaluative assessment within the literature is in its infancy, and given that the outcomes themselves are so varied and feature at multiple levels, it is not possible to provide clear-cut answers on the basis of this review of literature. However, external review of case study findings, anecdotal evidence from individual programme evaluations and the reflections of programme leaders seems to suggest that there are links that should be explored in more detail.

Contribution to sustainable development

It is perhaps too soon to report on the likely overall impact of the DESD. However, this review presents a timely opportunity to consider the areas in which change is emerging and the ways in which ESD appears to be contributing effectively to sustainable development.

The case studies reviewed in this document suggest that it is possible to map a wide range of contributions through ESD to economic, environmental, social (including cultural) and educational change. The review unpacks and categorizes the range of potential contributions and some of the themes and priorities that are apparent across these key initiatives. It has not sought to document or validate the actual changes. It has developed a template which could be adapted to serve as a data collation tool to inform the analysis of the in-depth case studies that will be generated during Phase II of the DESD.

ESD remains poorly researched and weakly evidenced. This expert review has been informed mainly by programme or context-specific research studies and programme evaluations. However, there is a lack of meta-analysis studies or longitudinal research. This means there is not sufficient evidence to provide conclusive responses to the core questions that drive the present review and other similar investigations into the value of ESD as a field of research and practice. These challenges will also confront the Phase II monitoring and evaluation report as it attempts to provide robust and meaningful evidence of the impact of the DESD initiative as a whole.

01
Context

Context

The United Nations Decade of Education for Sustainable Development (DESD, 2005-2014) is a global movement which seeks to transform education policy, investment and practice. Spanning 2005 to 2014, the ultimate goal of the DESD is to engage people and communities in meaningful lifelong learning processes which examine how societies can live in more sustainable ways (UNESCO 2004). Official DESD documents have consistently outlined a vision for a world where everyone has the opportunity to benefit from education and learn the values and lifestyle changes required for a sustainable future (UNESCO 2004, 6; UNESCO 2005, 4).

An international movement

International commitment to this Decade emerged at the Johannesburg World Summit on Sustainable Development (2002) where stakeholders recognised that education had become the forgotten priority of Rio[1]. To progress the implementation of Education for Sustainable Development (ESD) at national and international levels, a United Nations Decade of Education for Sustainable Development was proposed. On 20 December 2002 at its 57th session, the United Nations General Assembly adopted Resolution 57/254, to declare the United Nations Decade of Education for Sustainable Development. It designated UNESCO as the lead agency.[2]

The DESD recognises the important role of governments and seeks their commitment to (i) transform education and (ii) embed sustainable development into all education systems, plans and strategies. It looks to Member States to support public awareness and increase the reach of, and participation in, ESD initiatives (UNESCO 2004; UNESCO 2005). The DESD also seeks to promote international cooperation on ESD, by encouraging stakeholders from different society sectors and cultural backgrounds to share values and establish common goals for a sustainable future (UNESCO 2005).

The mid-term conference for the DESD was held in 2009 in Bonn[3], where progress was discussed and key priorities for the second half of the Decade were identified. The Bonn Declaration (2009a) calls for governments to develop ESD policies and frameworks that will ensure quality education for all and raise awareness about sustainability issues.

A global monitoring and evaluation process

The scope of the DESD is broad and its potential effects are far-reaching. If it is successful, the DESD could transform not only education but also the quality of life for many people across the globe[4]. Acknowledging the potential impact

1. Emerging from the Rio Summit (1992), Agenda 21 identified the need for countries to develop ESD strategies and frameworks as an important first step in contributing towards sustainable development.

2. UNESCO was designated as the lead agency and has the responsibility of establishing mechanisms for monitoring and evaluation as well as for reporting on progress to the UN General Assembly in 2010 and 2015 and to the UNESCO Executive Board at the end of each Biennium.

3. The UN World Conference on Education for Sustainable Development was held on the 30th March – 2nd April 2009 in Bonn. This conference gathered key government agencies, stake-holders and experts in the field with the purpose of reviewing the strategies and achievements of the first half of the decade and proposing actions for the second half.

4. This was the conclusion of a paper by Tilbury and Mula (2009) which assessed the contribution of the DESD to ESD.

of the DESD, UNESCO established a Monitoring and Evaluation Expert Group (MEEG) in 2007 to advise on appropriate monitoring mechanisms to assess (i) global progress in the implementation of the DESD; and (ii) UNESCO's contribution to the implementation of the DESD.

After its first meeting in 2007, the MEEG recommended that UNESCO publish three DESD implementation reports during the life of the Decade:

1. in 2009: focusing on the context and structures of work on ESD in Member States;
2. in 2011: focusing on processes and learning initiatives related to ESD; and,
3. in 2015: focusing on impacts and outcomes of the DESD.

The DESD International Implementation Scheme (UNESCO 2005) sets out the main trajectory of ESD as well as global milestones for the ten year period, to provide the basis for reporting. The Scheme identifies monitoring and evaluation as part of the implementation strategy and recommends the development of indicators at all levels.

The DESD Monitoring and Education report on contexts and structures for ESD was published in 2009[5]. It informed dialogue and reflections at Bonn as well as the UNESCO strategy for the second half of the DESD (UNESCO 2010). To prepare the 2011 report, and in keeping with previous experience of the implementation process of Phase I of the DESD monitoring & evaluation process, UNESCO commissioned a Phase II framework[6].

Several components underpin the Phase II framework in its attempt to capture the diversity of policy and practice and to assess their contribution to the attainment of sustainable development. The components are outlined in Appendix II. The cluster of data sources proposed includes 'an expert review in ESD' to clarify the types of learning processes that are most clearly aligned with ESD as well as the contributions of ESD learning activities to sustainable development.

Processes and learning in ESD[7] form the basis of the 2011 Global Progress Report in ESD. In this context, the term 'processes' refers to engagement opportunities, pedagogical approaches or teaching and learning styles adopted to implement ESD at different educational levels and in varied educational settings. 'Learning' for ESD refers to the learning experienced by all those engaged in ESD, including learners themselves, facilitators, coordinators and funders. Often learning in ESD is interpreted as gaining knowledge, values and theories related to sustainable development. In addition, this review will show that in ESD learning also means learning to: ask critical questions; envision more positive futures; clarify one's own values; think systemically; respond through applied learning opportunities; and to explore the dialectic between tradition and innovation.

5. The First Global Report was released in October 2009. It can be accessed at: http://unesdoc.unesco.org/images/0018/001849/ 184944e.pdf

6. See Appendix 1: Phase II of the Global Monitoring and Evaluation Process.

7. It is acknowledged that ESD is not often a stand-alone project or effort. ESD can be a strand or component of a sustainable development initiative.

02
An expert review

This document provides an expert review of literature on processes of learning for Education for Sustainable Development. It has been commissioned by UNESCO as part of Phase II of the global monitoring and evaluation process for the DESD[8] and supported by the Japanese Funds–in-Trust.

The purpose of the review is to address the first objective of the Phase II[9] which seeks clarification on:

i) which commonly accepted learning processes are aligned with ESD and should be promoted through ESD activities?

ii) What are ESD and related learning opportunities contributing to sustainable development?

The expert review is intended to inform data collection as well as evaluation assessments undertaken as part of Phase II of the global monitoring and evaluation process for DESD. It will form part of the first chapter of the 2011 DESD Global Monitoring and Evaluation Report.

A variety of key sources of literature from across the globe have been studied in the process of drawing up this review[10]. These have been written in different languages[11] and the author is grateful to those who have assisted with sourcing and translating documents for the purpose of the review.

The author also valued the contributions of key informants from specific sectors and thematic areas, who provided advice about which documents were key to answering the questions posed for this review.

This study has also captured several case study experiences through the eyes of the programme leaders or evaluators and the author is grateful to these contributors for sharing their insights on ESD processes and learning related to specific programmes. Comments made by critical friends on initial drafts of the document have also been extremely valuable in finalising the review findings[12].

It is important to note that this review has been researched and drafted over eight working days during a period of four weeks[13] and that this inevitably influenced the choice of documents as well as the quantity of literature that could be accessed and included within the review.

The draft of this review was validated by stakeholders through an on-line consultation process hosted by UNESCO DESD Secretariat between 15th July and 30th August 2010. The final draft was made available at the end of September 2010.

8. See Appendix 1 for details of the global monitoring and evaluation process.

9. Appendix 2 provides details of Phase II including the objectives and monitoring and evaluation components.

10. Although many documents were consulted only documents cited in the review are referenced in the bibliography.

11. Including, Cantonese Danish, English, Italian, German, Japanese, Mandarin, Russian, Spanish, Turkish.

12. Special thanks goes to Dr Alex Ryan from the University of Gloucestershire.

13. Initial emails were sent to stakeholders between the 24th and 28th April inviting submissions for the review with a deadline of 15th May. The author commenced the review on the 16h May and submitted the first draft on 14th June.

The following sections briefly summarize the key findings of the review under two headings which relate to: i) appropriate and commonly accepted learning processes aligned with ESD; and ii) the contribution of learning or education towards sustainable development, which is the core focus of this study.

03

What are commonly accepted learning processes aligned with ESD?

Education for Sustainable Development

Often the term 'education' is associated with what happens in classrooms. However, 'learning' in ESD occurs in a wide variety of social contexts. It includes what happens in the formal education system but also extends into daily and professional life (UNESCO 2004). In this way, all can benefit from ESD – and this is a goal consistent with the vision of the DESD (UNESCO 2005).

The literature, however, is heavily weighted towards ESD experiences that take place in school, further and higher education and other targeted educational outlets (such as field study centres, museums, national parks, etc.). Social, professional and institutional learning experiences in ESD that take place outside these systems are not at all well documented. Community learning practices are more recently cited in the sustainable development literature, as are learning opportunities arising out of social networking groups, but many other learning arenas are seldom recognised.

Processes of collaboration and dialogue

Under its inclusive banner of education and learning, ESD draws attention to two important and often interconnected processes: collaboration and dialogue. The ESD literature frequently calls for processes of collaboration in order to maximize capacity and increase engagement in learning geared to sustainable development. Further, Wals' (2009) review of experiences in the first half of the DESD confirms that ESD can help mobilise people's participation in sustainable development and their problem-solving capacity through processes which enable collaboration and dialogue.

There is a specific and pressing need to strengthen existing debates and activities around sustainable development issues in emerging economies given the increasing influence of globalisation on the erosion of cultural identities and local or indigenous practices (Lotz Sisitka 2005; Lee and Williams 2006). Several of the ESD case studies reviewed in Section 5 of this document support processes which build collaborative and learning partnerships across the social sectors to address this and other related needs. Examples shown in Box 3.1 encompass these various dimensions.

Box 3.1 Processes of collaboration

Case Study 5.2 *The SISC Projects: Community Empowerment for Sustainability* project links formal and informal learning settings, and thus connects people in villages with others working in nature reserves and those living in monasteries or nunneries, as well as teachers and pupils in schools.

Case Study 5.3 *The Pacific ESD Strategy* seeks collaboration and the establishment of cross-regional and cross-sectoral learning partnerships.

Case Study 5.6 *MESA Partnership of African Universities* actively encourages the development of partnerships and networks amongst universities, business, government, civil society and community partners.

Case Study 5.11 *The Dutch Learning for Sustainable Development Program* is a cooperative venture between six national government ministries, the association of provincial authorities and the association of water boards. The programme is built upon a foundation of collaboration between the Dutch Government and other professional groups. Engagement and participation in learning is taking place at different levels across the project. The project sees this as key to promoting and facilitating ESD.

Recently commissioned studies into national ESD strategies confirm the importance of processes which enable multi-stakeholder and intercultural dialogue (Tilbury and Cooke 2005[14]; Tilbury and Mula 2009[15]). These processes are seen as vital to negotiating more sustainable futures and often focus upon marginalized views and minority perspectives that can be critical to the success and value of such initiatives. In some cases, multi-stakeholder dialogue underpinned the processes of developing the national frameworks as well as being embodied in their content. Others which stressed the importance of intercultural dialogue processes in the achievement of sustainable development often neglected to include cultural stakeholders in the process of development, implementation and/or evaluation of these frameworks.

Some programmes extend multi-stakeholder dialogue into social learning which engages stakeholders in learning from each other. This process is captured in Wals et al. (2009) '***The Acoustics of Social Learning***' and underpins **Case Study 5.11** *The Dutch Learning for Sustainable Development Program* which brings stakeholders together to engage in dialogue through workshops, networks, websites for sharing and co-creating knowledge. This process also forms the basis of the Austrian Strategy in ESD (2008) which seeks to create opportunities for social engagement and learning at various levels.

14. Section 1.5 reviews national ESD strategies as well as sustainable development frameworks which have a learning or ESD component. It includes an in-depth review of frameworks from Australia, The Netherlands, Sweden, UNECE and UK.

15. This review commissioned by UNESCO Culture in 2009 studied 7 national ESD strategies: Canada, Jamaica, Kenya, México, New Zealand; Pakistan and Wales (United Kingdom); and, two regional ESD frameworks: Asia-Pacific and Sub-Saharan Africa.

Processes which engage the 'whole system'

Some programmes take further strategic steps that are designed to engage with the 'whole system' in which they are based and through which they operate. For example, Wals (2009), in his review of ESD experiences in the first half of the DESD, argues that developing synergies through ESD across schools, communities and universities is necessary to enhance the quality of education and of life in Africa.

A research study undertaken in Australia by Ferreira et al. (2007) sought to identify success factors underpinning ESD teacher education initiatives by reviewing experiences from across the globe. Planning to engage with the system as a whole (schools, government and regulatory bodies, NGOs as well as teacher education institutions) was seen as a vital factor in progressing learning for sustainable development across the initiatives reviewed[16].

ESD has the strategic intention to reorient education to support sustainable development (UNESCO 2002; 2005). This means that ESD gives attention to not only specific learning approaches and techniques used within education but also to the professional and management processes adopted across educational systems themselves. This holistic approach means that ESD is brought to life not only in the curriculum or educational programmes but also in institutions and organisations which facilitate these learning processes.

Box 3.2 below maps some examples where stakeholders are engaged in 'whole system' change processes.

16. Twenty initiatives were reviewed from Europe, Asia Pacific and the Caribbean.

Box 3.2 Processes which engage the 'whole system'

Case Study 5.1 *The Rous Water Early Childhood Water Aware Programme* documents an early childhood water education program which involves all members of a centre's community - children and their families; staff and management committees; local community and other stakeholders of early childhood education services (from birth to 5 years, e.g., long day care centres, kindergartens and preschools). Tackling the whole community was seen as key to the success of this programme by the evaluators (Davis et al. 2008).

Case Study 5.3 *The Pacific ESD Strategy* seeks to involve all possible stakeholders: educators, researchers, business sector, policy makers, NGOs, community leaders, influential groups in extending ESD opportunities across the region.

Case Study 5.10 *Learning About Energy Efficiency*, The project involved the whole system including: i) Ministries of Education and Science, Ministry of Environmental Protection; ii) teachers and students at the pilot university; iii) NGOs including Baiterek, EcoObraz, EcoCenter-Karaganda, Otrazhenie; iv) international organizations such as CAREC and SGP GEF UNDP, plus v) the Kazakhstan business sector, through Company Chevron.

Case Study 5.12 *Sustainability and Education Academy (SEdA)* engages the entire system of leaders, including the ministry of education, University faculties of education and the school leaders as learning teams.

Processes of innovation

ESD learning is sometimes interpreted as the process of gaining knowledge, values and theories related to sustainable development but it also prioritises the changing of mindsets and active engagement of the learner in matters relating to more sustainable futures. Current learning processes and practices are generally not aligned with this transformative view of education (Lotz Sisitka 2006; Fien, Maclean and Park 2009). Thus ESD supports processes which stimulate innovation within curricula as well as through teaching and learning experiences. A significant example of this type of initiative is outlined in Box 3.3.

Box.3.3 Innovation through ESD

Case Study 5.6 MESA is premised on a concept of ESD innovations, and all its activities support university teachers and professors to learn more about sustainable development and ESD in various ways (i.e., taking the view that there is no one 'recipe'). It supports university lecturers and managers to see that a sustainable society will require new ways of thinking about teaching, learning and knowledge in universities, and that universities need to support social learning processes, and not just traditional forms of academic learning, although these too are important to build the knowledge foundations necessary for reflexivity and change.

Sterling (2004 p.50) argues that sustainable development provides 'a gateway to a different view of pedagogy' and this idea is supported by numerous ESD writings from across the globe such as: Hesselink et al. (2000); Bhandari and Abe (2003); Fien (2001); Gadotti (2008), Haigh (2006); Hopkins (2009); Kasimov et al. (2005); Lee et al.. 2006; Liu (2010); Mayer et al.. (2007); PCE (2004); Raufflet et al. 2009; Ravindranath 2007; Scoullos et al. (2004); and, Tilbury and Wortman (2004).

Close analysis suggests that this focus on pedagogy is not entirely new, nor is it particular to ESD (Gonzalez-Gaudiano 2005). Transformative views of pedagogy have informed adjectival educational movements[17] such as peace education; health education; global education; development education; and, environmental education. Many adjectival education trends have proposed more than thematic considerations and sought changes in the way that curricula and learning opportunities were framed. They have called for more interactive approaches which challenge the concept of the teacher as disseminator of knowledge and have engaged students in questioning social assumptions and dominant ways of thinking through their educational journeys (see Pike and Selby 1987). ESD likewise seeks to promote this transformation in how it engages with educational systems and practices and Figure 1 summarises some of the educational shifts it prioritizes.

17. Term first coined by John Smyth.

Figure 1: Educational shifts proposed by ESD

From	*To*
• Passing on knowledge	• Understanding and getting to the root of issues
• Teaching attitudes and values	• Encouraging values clarification
• Seeing people as the problem	• Seeing people as facilitators of change
• Sending messages	• Dialogue, negotiation and action
• Behaving as expert - formal & authoritarian	• Acting as a partner - informal & egalitarian
• Raising awareness and	• Changing the mental models which influence decisions & actions
• Changing behaviour	• More focus on structural and institutional change

Processes of active and participatory learning

Cotton and Winter (2010) directly asked a number of colleagues in a UK higher education institution which pedagogical approaches they associated with ESD and concluded that active learning processes were considered essential. Although the research was small scale, drawing on a survey sample of university educators, it identifies commonly used active learning techniques and the reasons they are considered to be relevant to ESD (see Figure 2 below).

This study coincides with writings and other studies from scholars across the globe and working in different sectors; they suggest that educators align ESD with active and participatory learning processes (see ACCU 2010; Alvarez and Rogers 2006; Anderberg et al.. 2009; APCEIU 2005; Banh et al.. 2010; Blewitt and Cullingford 2004; Breiting et al.. 2005; Charbel and Chiappetta 2010; Cohen et al.. 2002; Delgado et al.. 2007; Doppelt 2003; Domask 2007; Elias and Sachathep 2009; Galkute and Shakirova 2009; Haslett et al.. 2010; IUCN 2010; Kearins and Springett 2003; Laessoe et al.. 2009; Morgensen and Mayer 2005; Shakirova and Iskhakova 2006; Tran 2010; Wang and Wei 2007; Wortman et al.. 2006), despite the lack of empirical evidence proving the effectiveness of these methods in achieving the goals of sustainable development.

Figure 2: Research into commonly adopted ESD pedagogies in higher education - adapted from Cotton and Winter (2010)

Pedagogical strategies	*Learning process involved*
Role-plays and simulations	These often cited techniques provide an opportunity for learners to gain an in-depth understanding of another person's perspective and to empathize with others.
Group discussions	Group discussions were frequently mentioned by both school teachers and lecturers when asked to describe an appropriate pedagogy for sustainability. The use of discussion is attempt to counter-act the risk of the tutor taking a transmissive or authoritarian approach, thereby enabling students to explore their own and others' views. The facil-itator often encourages listening and self-reflection rather than argument.
Stimulus activities	A stimulus activity might involve watching a video or looking at photos, poems or newspaper extracts to initiate reflection or discussion. Students may even be involved in producing their own work such as pho-tos taken to stimulate a discussion. Use of videos or externally-produced documents has enabled the facilitators to bring in a wide range of viewpoints for critical analysis.
Debates	Debates in which two groups of students put forward opposing argu-ments on an issue are often cited as a common method of teaching about sustainability since they encourage students to gather information about the topic and develop an argument. However, they need to be carefully handled as they can become confrontational and learners may be discour-aged from engaging or empathizing with others' views.
Critical incidents	The use of critical incidents to teach sustainability is relatively new. Learn-ers are given an example and asked what they would do, what they could do and what they should. This allows them to consider their personal per-spectives and actions in the light of a moral or ethical stance. The approach can also be used with groups to promote awareness about multiple per-spectives on sustainability.
Case studies	This is another popular choice of pedagogy for teaching sustainability. Tutors described using case studies to bring ESD into areas of the curriculum that had not traditionally involved a clear focus on sustainabil-ity, and to provide learners with an holistic view of an issue. Case studies enable students to investigate issues that affect their local area, to work with private enterprises and community groups and to work together in finding solutions for local issues.

Pedagogical strategies	***Learning process involved***
Reflexive accounts	Considering their own position in relation to new knowledge about sustainability can help students understand how individual actions contribute to sustainability. This pedagogical approach provides opportunities for learners to reflect on personal roles, attitudes and responsibilities in relation to a range of sustainability issues.
Critical reading and writing	Reading and writing are seen by tutors as important social practices and the key to progressing sustainability and literacy. Learners can gain from deconstructing discourses to identify the possible motivation of the author. They may also be able to envisage alternative futures, and write a contrasting account based on differing perspectives.
Problem-based learning	Problem-based learning is an iterative learning process that is used to teach a whole range of subject matter. In the context of ESD, a sustainability-related issue may be identified and students asked to investigate this to generate a body of knowledge. They can then develop a vision of alternative actions and potential solutions to the problem, which they use to devise a plan of action. The action may then be carried out, followed by a period of reflection and evaluation. This process promotes both the conceptual and practical aspects of sustainability literacy.
Fieldwork and outdoor learning	Research has shown that fieldwork is an example of experiential pedagogy that can influence students' emotions (Sivek, 2002) and help develop the critical thinking skills so essential to understanding the complexity of sustainability (Jones, 2003; Scott and Gough, 2003). Fieldwork for sustainability is often based on issues in the local community and environs, linking theory to real-world examples (Hope, 2009). There is also evidence that outdoor experience is an important precursor to understanding sustainability (Palmer and Suggate, 1996) and promotes learning by encouraging active learning (Hope, 2009).
Modelling good practice	Learning also taking place implicitly through the hidden curriculum. The research captured how many educators sought to reduce paper use and turned off lights out at the end of sessions as a means of teaching learners the importance of action-taking.

The list presented in Figure 2 could be extended to include other forms of learning which engage the learner actively in the exploration of sustainable development issues. There are several documented ESD experiences from Benin, Canada, Fiji, Korea, Indonesia, Vanuatu, Vietnam and Australia which suggest that story-telling, puppetry, acting and other performance-related techniques are also used to provide ESD learning opportunities in schools as well as across communities (see Tilbury et al. 2000; Bhandari and Abe 2003).

The case studies documented and reviewed as part of this study (see Section 5) also support the notion that active and participatory learning processes are aligned with ESD intentions and frameworks. Box 3.4 captures a diversity of active learning techniques used to engage the learner as a participant in the education process.

A second wave of pedagogical initiatives and approaches recognizes that the 'active engagement' of the learner in ESD can be virtual. Recent ESD articles record how interactive technologies, social networking and the internet provide a critical means of engaging younger generations in learning ***about*** and ***for*** sustainable development (Nordén, 2007; Sjerps-Jones 2009).

Box 3.4 Processes of active learning

Case Study 5.1 *The Rous Water Early Childhood Water Aware Programme* used stories, songs, and puppetry to actively engage children and help them learn to become 'water-watchers'.

Case Study 5.2 *The SISC Projects: Community Empowerment for Sustainability* engaged community members in active exploration of issues through music and dance, oral histories, painting and worship of sacred mountains and lakes.

Case Study 5.7 In the *Japan CSR Project* participatory learning underpins all key activities in the interactive symposium and workshop series, in order to avoid one-way knowledge transfer, to maximise capacity-building and to share expertise.

Case Study 5.11 *The Dutch Learning for Sustainable Development Program* adopts approaches such as action research, storytelling and learning that are increasingly focused on direct experiences, real-life projects, and working and learning trajectories.

An international review of national and regional ESD strategies also supports the notion that participatory and active learning approaches are perceived as most appropriate to learning for sustainable development (See Tilbury and Cooke 2005). It is important to acknowledge, however, that these often require a renewal of the curriculum or the retraining of educators. This challenge, it is argued, requires far more than the development of toolkits or resources (Cotton and Winter 2010). Changes are needed in initial teacher education, professional development of existing educators, and the training of facilitators, tutors and mentors, as well as practitioner research to prepare educators for the pedagogical challenges ESD involves.

Active and participatory learning have been broadly agreed as core processes underpinning ESD by a number of researchers and commentators worldwide and across educational settings. They are commonly recognised as central to teaching and learning strategies for sustainable development because they encourage learners to:

- ask critical reflective questions;
- clarify values;
- envision more positive futures;
- think systemically;
- respond through applied learning;
- explore the dialectic between tradition and innovation.

Learning to ask critical reflective questions

'Every day we are exposed to a barrage of information, advertisements and stories in newspapers, on billboards and on television…information that tells us what is important in the world…advertisements that tell us about our priorities in life…and billboards that encourage us to consume.

It may seem all too easy to just accept what we read and what we are told… but stop to think about what is really being said…what are we really being sold? …What are the real messages?... Who is telling them and why are they telling them? Who benefits from these messages?

Next reflect on your own thoughts and perceptions …What assumptions are you making about the messages you read and hear? …How do your personal values influence these perceptions? …How has your family life, culture, gender or faith shaped the way you interpret these messages…the world?' [18]

18. Adapted from Tilbury and Wortman (2004).

Exploring these questions, their answers and the responses they provoke forms part of a 'critical reflective thinking' learning process. The ESD literature has been consistent in outlining the need for critical thinking since the term first appeared in the late 1980s[19]. This process challenges learners to examine the way they interpret the world and how the knowledge and opinions of people are shaped. It helps learners to understand the influence of the media and advertising as well as the power of particular social groups to shape agendas. Along with the process of values clarification, critical reflective thinking can help to uncover how culture can influence values and beliefs, so that the cultural, professional and personal complexities surrounding sustainable development can be understood. The process is critical to ensuring that individuals and groups are able to contribute to sustainability in genuinely autonomous and authentic ways.

Although there is mainstream support for this process, there is evidence that critical reflective thinking is often misunderstood (Tilbury et al. 2005). Some mistake it with the process of critique and invite people or groups to be critical of particular situations or events. Critical reflective thinking in ESD is a more profound process involving a deep examination of the root causes of unsustainability and it engages learners in recognising bias and the assumptions underlying their own knowledge, perspectives and opinions.

Box 3.5 Critical reflective thinking

Education for sustainable development must explore the economic, political and social implications of sustainability by encouraging learners to reflect critically on their own areas of the world, to identify non-viable elements in their own lives and to explore the tensions among conflicting aims.

(UNESCO 2002 p.12)

Evidence of critical reflective practice can be found across educational levels from early childhood education (Davis 2009; Elliot 2010); to school education (Mogensen et al. 2009; Rauch and Steiner 2006); to teacher education (Fien 1995; Huckle 1999; Ferreira et al. 2009; Ohman and OStman 2007); to business education (Doppelt 2003) to higher education (Anderberg, Nordén and Hansson 2009; Dlouha 2008; Sriraman 2009; Waldron and Leung 2009) and across social groups (Balzaretti-Heym 2002; Lee and Williams 2006; Liu 2007). The case study examples captured in this review (see Section 5) also refer to critical thinking and reflexivity as processes which help learners when

19. Tilbury and Wortman (2004) provides an overview of this literature.

confronted with sustainable development issues. Some identify this process as critical to the success of the project (See Box 3.6)

Box 3.6 Critical reflective thinking across the Case Studies

Case Study 5.5 *ESD Quality Criteria for Schools* is underpinned by critical thinking – which helps learners be open to the language of possibility and problem-solve in the context of sustainable development.

Case Study 5.4 *Learning for Social Entrepreneurship in Egypt* promotes creativity and critical thinking throughout the initiative.

Case Study 5.8 *The Czech Multimedia Toolkit* focusing on developing critical thinking which enable students to investigate various perspectives; learning to formulate questions and re-formulate ideas.

Learning to clarify values

This process is seen as a means of assisting learners to deconstruct socialised values, challenging them to become actively conscious of values which have been inherited, chosen and/or socially embedded (UNECE 2010). It therefore assists individuals and groups to recognise bias and develop an ability to understand how background, culture and values interact to shape our knowledge and perceptions and those of others (UNESCO 2002).

When combined with critical reflective thinking, the ability to engage in values clarification provides a powerful tool for understanding and making decisions in relation to personal and professional responses for sustainability and to see the links between lifestyles, consumption and sustainability (Balzaretti-Hyem 2002).

This learning process also provides opportunities for understanding cultural and indigenous values and how these are challenged by globalisation and modernisation. It engages the learner in clarifying (and often reconstructing) a values base to inform thinking and actions which influence sustainable development (PCE 2004).

Values clarification also assists in understanding the values held by others: providing a basis for exploring social identities as well as cultural diversity. It helps to identify often unconscious or unarticulated values which can promote or stifle dialogue or engagement towards sustainable development (Tilbury and Wortman 2004).

The recently convened UNECE Expert Group on ESD Competencies[20] brought together representatives from Belgium, Canada, Hungary, Ireland, Germany, Georgia, Greece, Central Asian Working Group on ESD, Lithuania, The Netherlands, Russia, Sweden and the UK as well as several UN agencies. The Group, recognising the importance of values clarification to ESD, identified educator competencies associated with these processes (UNECE 2010b).

Two of the case studies reviewed in Section 5 explicitly identified values clarification as a critical process underpinning the ESD learning experience.

Box 3.7 Values clarification

- **Case Study 5.2** *The SISC Projects: Community Empowerment for Sustainability.* The project encourages learners to reconnect with local culture and deep belief systems. It engages the learner in an exploration of values such as: frugality (common in China's 3 main philosophies: Buddhism, Daoism and Confucianism)**;** harmony and interconnectedness: with nature, the family, community, nation and beyond; self-cultivation for improvement of society; respect for diversity and plurality; a sense of spiritual wealth as opposed to material wealth.
- **Case Study 5.5** *ESD Quality Criteria* Project is underpinned by values clarification. It invites schools to engage in value clarification processes which explore personal, social and institutional values and cultures.

20. Expert Group was convened in 2009 and has a mandate from the UNECE Steering Group on ESD to identify educator competencies in ESD (See UNECE 2010a).

Learning to envision more positive futures

'Imagine…a world in which people from all backgrounds and levels of expertise are engaged in a process of learning for improving quality of life for all within their community…as well as beyond, allowing for future generations…

A world in which people recognise what is of value to sustain and maintain and what needs to change through reflecting…understanding…asking…

making choices and participating in change for a better world….a world in which people share in the stories of inspiration and lessons learnt for all to benefit from...' [21]

Envisioning or futures thinking is considered to be a pivotal component of ESD. It is a process which is transforming the way people relate to their future, helping to cultivate dreams, inspire hope and lead to action plans for a more sustainable future. This process is encouraged at all educational levels as well as in social and business contexts (Bhandari and Osamu 2003; Burchstean and Byrne 2001; Enviroschools Foundation 2004; Ferriera et al. 2009; IUCN 2010; Mogensen 2009; PCE 2004; Ryan and Tilbury 2010; UNECE 2010; UNESCO 2003).

This futures thinking process helps people to discover their possible or preferred futures and to uncover beliefs and assumptions that underlie their visions and choices. Several of the case studies documented in Section 5 of this study refer to futures thinking processes as important to the attainment of sustainable development (See Box 3.8).

The process of envisioning provides a space for people to engage in a meaningful interpretation of sustainability, linking and channelling this information into a shared common vision for the future (Doppelt 2003; Remmers 2008). Most importantly, envisioning offers direction and energy and provides impetus for active engagement in issues as it harnesses aspirations and motivation. Envisioning also enables people to look at situations, problems and obstacles and to consider better ways of observing them.

The envisioning process can enable people to make decisions regarding 'where to next' but also how their actions today contribute to or detract from their

21. Adapted from Tilbury and Wortman (2004).

vision. This realisation is vital in helping people to take ownership of, and responsibility for, working towards a better future (UNESCO 2003; EnviroSchools 2004; PCE 2004).

Envisioning is a process that is inclusive to all cultures and one that begins a dialogue which strengthens intercultural understanding. It can act as a bridge between indigenous knowledge; traditional perspectives and new practices (Henderson 2004; Mula and Tilbury 2009; Shakirova and Shaimardanova, 2009).

Box 3.8 Futures orientation

Case Study 5.5 *ESD Quality Criteria* project proposes ESD learning processes which involve: ***futures thinking*** - asking children to imagine and compare long- term effects of their choices.

Case Study 5.10 *Learning Energy Efficiency, Kazakhstan* uses ESD learning approaches which encouraged students to reflect and engage with visions of more positive futures.

Learning to think systemically

'Imagine a world where decision-makers 'saw the whole picture' honouring the links between their actions and local, regional and global issues…

Image a world where businesses and governments made decisions in a holistic way that embraced the benefits and effects on communities and environments…

Imagine a world where people and communities had the skills to understand links between our thinking, actions and impact across our world…where they are empowered to address core problems and not just the symptoms.'[22]

22. Adapted from Tilbury and Wortman (2004).

Systemic thinking helps learners approach the world from a different perspective (Bateson 2000). It challenges the existing 'thinking legacy' in educational practice which emphasises analysis and understanding by taking ideas or products apart (Sterling 2005). Systemic thinking encourages us to understand and manage situations marked by complexity. It supports integrative and adaptive processes of thinking and practice, seeking to 'join-up' thinking across disciplines, sectors and different social, environmental and economic and educational systems (WWF Scotland 2010). It helps develop understanding of connectivity and how a decision relates or impacts consequences of actions which are not intended (UNECE 2010b). It acknowledges the side effects or externalities of actions (Sterling 2005) and encourages learners to explore:

> Q. How can we do things in ways that do not contradict intended actions?
>
> Q. How can we make decisions that complement rather than conflict with each other?
>
> Q. How can we think, act and educate in ways which reflect the complexity and interconnectedness of the real world?[23]

In essence, systemic thinking is about 'seeing the big picture'. For example, Doppelt (2004) emphasises the importance of this process challenging a 'siloed approach to environmental and socio-economic issues' in business whilst Mayer et al. (2008) see systemic thinking as integral to the ethos of a sustainable school.

Several case studies documented in Section 5 of this study point to the importance of using processes which assist learners to see this big picture. This is seen as an important distinguishing feature of Case Study 5.1 on Early Childhood Education Centres which applies systems thinking in its design as well as in the pedagogical processes it promotes. Case Study 5.5 ESD Quality Criteria for schools is underpinned by opportunities to learn about systems and to make students aware of a new culture of 'complexity' where students and teachers prepare themselves 'to expect the unexpected and to deal with it'. Case Study 5.8 the Czech Multimedia Toolkit is also underpinned by systemic thinking processes which encourages the exploration of interrelationships and a non-linear reading of the reality.

Systemic thinking is important not just at the pedagogical level but in terms of framing ESD strategies and programmes. Wals (2010) alerts policy-makers and programme leaders to the importance of integrative thinking to ESD in relation to to the attainment of the Millennium Development Goals (MDGs) and to addressing underlying priorities such as HIV and AIDS education, peace-building and human rights. He cites the MESA (see Case Study 5.6) as exemplary in practising integrative planning and pedagogical processes to address the MDGs. The MESA Partnership of African Universities involves university teachers and

23. Adapted form Sterling (2005).

lecturers from all university disciplines, and encourages an understanding of how individual disciplines can contribute to ESD, but perhaps more importantly how transdisciplinary knowledge creation is possible at the level of practice – where sustainability issues are experienced in communities, schools and in the day-to-day production and consumption practices in society. Systemic planning and thinking processes underpin this initiative.

Learning to respond through applied learning

Most of the case studies reviewed in Section 5 of this document have an applied learning component. For example, Case Study 5.12 the Sustainability and Education Academy (SEdA) from Canada has an emphasis on applying the learning so that the teams leave the Academy with action plans they have created. These plans address minor to profound change from curriculum to estates and include new transportation policies, custodial practice, food policy and purchasing policy. Case Study 5.13 the SiSC Project also has strong emphasis on applying the learning of trainee educators to community contexts with course participants expected to engage in practical action projects.

Applied learning invites learners to participate in sustainable development and to respond to and engage in real-life contexts. Recent research on sustainable schools initiatives suggests that participation of learners furthers young people's understanding of sustainable development issues and also their awareness of what they can do for themselves, and with others, to construct more sustainable futures (Barratt Hacking et al. 2010). These processes are seen to build confidence and self esteem thereby enriching the educational experiences of learners (Gayford 2009).

Applied learning approaches are often chosen for their ability to tap into *'collective creativity and innovation which is necessary for change'* towards sustainable development (Waldron and Leung 2009) as well as for the opportunities they offer learners to identify and confront bias (Cotton and Winter 2010). Participatory and democratic learning approaches are especially important, given concerns that ESD could be co-opted as a social engineering process that would in fact limit freedom through efforts to manipulate behaviour (Jickling and Spork 1998; Jickling 2003; Gutiérrez and Pozo 2005; Jickling 2006; Sauvé and Berryman 2005).

As has been shown in studies of behaviour change in ESD (and on related issues such as habit formation), efforts to manipulate behaviour based on a negative framework that identifies certain actions as problematic do not tend to succeed and are in conflict with the goals of ESD (Ryan and Tilbury 2010). They

misunderstand motivation and misapply models of corrective encouragement, rather than harnessing the inherent potential of people to learn and to choose constructive and adaptive responses to issues and scenarios.

Box 3.9 Applied learning

Case Study 5.1 The *Rous Water Early Childhood Water Aware Programme* provided ESD opportunities in relation to water at both educational and operational levels. In other words, the programme practices what it preaches. Centre managers become engaged in a water audit to understand their centre's current water usage. They become involved in developing an action plan to support ongoing water conservation measures specific to their centre's needs whilst the teachers create learning opportunities around these activities.

Case Study 5.2 The *SISC Projects: Community Empowerment for Sustainability* is action based as it seeks tangible results in environmental, social, economic and political spheres.

Case Study 5.7 The *CSR Project from Japan* worked by bringing 'real-life' business experiences into engagement with sustainable development and CSR issues. The process was designed to provide applied learning opportunities for the participants and to develop better guidelines by including input from diverse examples of CSR in action, in real business strategies, functions and contexts. One participant who had previously regarded ESD and CSR as too idealistic stated that the workshops had enabled him to think about these areas in concrete ways.

Case Study 5.10 *Learning About Energy Efficiency, Kazakhstan* applied learning processes were key aspects of this programme. The project effectively combined theoretical knowledge (seminars and training for teachers and students on SD, climate change and energy efficiency) with practical activities (on-site competition for student pilot projects on energy saving and energy efficiency).

Other case study examples documented in Box 3.9 show projects in which learners respond to sustainable development issues through applied learning opportunities.

Learning to explore the dialectic between tradition and innovation

This aspect of ESD learning has not generally been singled out by the ESD literature but was an emerging theme in a study of ESD frameworks[24] as well as across some of the case studies reviewed in Section 5.

Underpinning this process is the need to explore cultural values and traditions in a way which respect diversity, protect traditional knowledge and if necessary challenge exploitative practices. At the same time as respecting cultural diversity and engaging in a process of intercultural dialogue, many initiatives encouraged the exploration of new opportunities offered by technological innovation or market needs. For example, Case Study 5.2 The SiSC Project explored opportunities associated with solar power, ecotourism, biogas whilst also encouraging learners to reconnect with local culture and deep belief systems. The project encourages an exploration of values such as: frugality (common to Buddhism, Daoism and Confucianism); harmony and interconnectedness: with nature, the family, community, nation and beyond; self-cultivation for improvement of society; respect for diversity and plurality; a sense of spiritual wealth as opposed to material wealth.

This provides a good example of how ESD programmes seek change to provide sustainable futures at one level but protect and promote cultural values and traditions at another level. It also addresses a critical set of capabilities that have particular relevance to emerging economies, where decisions must be made about preservation and eradication of former ways of life, and about the methods and means of future development. These issues have perhaps received less attention overall in the ESD literature that has emerged to date from developed Western nations. Case Study 5.3 the Pacific ESD Strategy also refers to this need to protect indigenous knowledge but also use information and communication technologies effectively to promote sustainable development. Case Study 5.4 on Learning for Social Entrepreneurship in Egypt faces similar tensions but also manages to combine opportunities for learning of local cultures and priorities with learning about appropriate technology.

24. See Tilbury and Mula 2009. A UNESCO commissioned study which reviewed 11 ESD frameworks.

In brief

The term 'processes' in this context, refers to engagement opportunities, pedagogical approaches or teaching and learning styles adopted to implement ESD in different levels and settings of education and in other informal and social learning scenarios.

The review has identified that certain key processes underpin ESD frameworks and practices. These include:

i) processes of collaboration and dialogue (including multi-stakeholder and intercultural dialogue);

ii) processes which engage the 'whole system';

iii) processes which stimulate innovation within curricula as well as through teaching and learning experiences; and,

iv) processes of active and participatory learning.

'Learning' for ESD refers to what has been learned by those engaged in ESD, including the learners themselves as well as facilitators, coordinators and funders. Often learning is interpreted as the gaining of knowledge, values and theories related to sustainable development but as this review indicates, that ESD learning also refers to:

i) learning to ask critical questions;

ii) learning to clarify one's own values;

iii) learning to envision more positive and sustainable futures;

iv) learning to think systemically;

v) learning to respond through applied learning;

vi) learning to explore the dialectic between tradition and innovation.

04
What is the contribution of learning to sustainable development?

Box 4.1 Understanding sustainable development

'Sustainable development is a way of thinking about how we organize our lives and work – including our education system – so that we don't destroy our most precious resource, the planet … It must be much more than recycling bottles or giving money to charity. It is about thinking and working in a profoundly different way.' (Department for Education and Skills, UK, 2006, p.6).

Two key premises are embedded within the core ESD literature. Firstly, that at this moment in time, there is no country which is sustainable. There is no roadmap or recipe for success and therefore we have to learn our way towards more sustainable futures (Prescott Allen 2002). This notion also underpins the UNESCO literature which recognises that there is international consensus *'that achieving sustainable development is essentially a process of learning' (UNESCO 2002 p.7).*

Secondly, that sustainable development requires a shift in the mental models which frame our thinking and inform our decisions and actions (UNESCO 2005; UNESCO 2009). This is reflected in national and international policies from around the globe (see Box 4.1 for an example) as well as the goals of specific national and regional programmes as documented in Section 5.

This combined understanding of sustainable development provides the foundation for ESD efforts and informs the intended contributions of ESD activities to sustainable development.

The ESD literature has only recently begun to feature evaluative studies that map the outcomes, outputs and impacts of ESD projects and programmes. The case studies written for the purposes of this review and documented in Section 5 provide important opportunities to assess these types of contributions in greater detail than is possible from studying the experiences documented in existing literature[25]. Analysis of the case studies reveals that changes are being nurtured at several levels: social, economic, environmental and educational. Although the effects and issues are often intertwined, it is helpful to consider the dynamics and priorities at each level.

25. Please note that with the exception of Case Study 5.1, the case studies provide reflective analysis rather than empirical evidence arising from evaluations.

Social change[26]

A review of the case studies documented in Section 5 indicates that every project sought social change for sustainable development (see Box 4.2). Interrogation of other examples from the international literature also reveals that social change is at the heart of most ESD initiatives (see Elias and Sachathep 2009; Ferreira et al. 2009; GHK et al. 2008). Social change occurs at a number of levels and contexts; for example, it can range from changing consumer choices, to challenging business practices, to rediscovering (or re-valuing) traditional knowledge and local languages. The ESD initiatives reviewed focus on particular social groups such as business leaders, youth, students, farmers, academics or vulnerable/socially excluded communities. They aim to empower these groups through capacity-building to develop new ambitions for the future and to engage in social change to achieve them. These types of initiatives challenge visions, personal and professional practices as well as lifestyle and consumer choices.

At the heart of the ESD initiatives is an assumption that current social frameworks and practices are exploiting people and their environments. Thus the attainment of sustainable development requires transformative change at the social and/or cultural level. Some programmes and/or strategies explicitly refer to the creation of social capital as key outcome of ESD initiatives. This requires building the confidence and skills to support engagement among stakeholders, to improve their own and others' lives, livelihoods and environments.

Many initiatives encourage consideration of new social frameworks which link the protection of traditional cultural practices and indigenous knowledge to the exploration of new economic markets and technological innovations which are more beneficial to people and to the planet. The type of capacity-building that is promoted is often culturally sensitive and responsive to local needs and cultures. Intercultural dialogue and respect for cultural diversity underpins many of these efforts to promote ESD and these kinds of outcomes are used to measure the success of initiatives.

Some ESD initiatives measured their success by assessing the degree of participation by target groups in sustainable development issues. Many such programmes prioritise citizen/employee/learner participation and view active engagement in social issues as key to the attainment of sustainable development (see for example Case Studies 5.2; 5.5; 5.7; 5.10 in Box 4.2). Other projects focus upon engagement of organisations or institutions and their goals take the form of leadership for change towards sustainable development (see for example Case Studies 5.11; 5.12).

26. The term 'change' is used here in its broadest sense and refers to changing unsustainable practices which threaten culture; cultural diversity and quality of life.

Box 4.2 Contributions of ESD to sustainable development: Social change

In ***Case Study 5.1*** *The Rous Water Early Childhood Water Aware Programme,* children are empowered as change agents for sustainability – they show leadership and advocacy for water conservation in their centres and homes; they help their parents 'unlearn' water-wasting habits and attitudes.

In ***Case Study 5.2*** *The SISC Projects: Community Empowerment for Sustainability* illustrates how ESD improved confidence amongst community members, which has led to higher levels of participation (democracy) and engagement in the issues and which in turn has led to the improvement of livelihoods. The project has served to maintain traditions and traditional learning as well as local languages. It has inspired communities to protect their cultural and natural heritage.

In ***Case Study 5.3*** *The Pacific ESD Framework* empowers learners and policy-makers to contribute to sustainable development through capacity-building processes. It promotes development in a way which is culturally sensitive and acknowledges the importance of taking local needs into account. The framework also acknowledges the importance of indigenous and local knowledge to achieve more sustainable practices.

In ***Case Study 5.4*** *Learning for Social Entrepreneurship in Egypt* responds to communities that have been marginalised or excluded by existing market actors and non-market institutions. It offers alternative opportunities and empowers young people in situations of social exclusion. For example: Tafanin addresses community issues through social responsibility campaigns and offers marketing opportunities for companies and businesses.

In ***Case Study 5.5*** *The ESD Quality Criteria* ask to schools to '***become institutions active in society'***. Equally, children, parents, local government, community organizations and members are recognised as relevant stakeholders in the development of a sustainable school.

In ***Case Study 5.6*** *The MESA Partnership of African Universities* recognises that ESD contributes to a 'learning society' in which people learn from, and with, one another – they become collectively more capable of withstanding setbacks and dealing with sustainability-related complexity and risks.

In ***Case Study 5.7*** The Japanese ***Corporate Social Responsibility (CSR) Project*** focused on the need to reorient business practice to support more sustainable patterns of development. This important shift requires the development of wide-ranging business expertise and collaboration to deal with the complexity of sustainability issues.

In ***Case Study 5.8*** The *Czech Multimedia Toolkit* supports community-building through engagement in the process of knowledge creation. It seeks to support university lecturers and managers to see that a sustainable society will require new ways of thinking about teaching, learning and living.

In ***Case Study 5.9*** *The ESD for Peace* example worked with communities that had been involved in the civil wars in Central America and/or suffered from socioeconomic exclusion and confronted myriad social and developmental challenges. The Program provided opportunities for communities to forge models of personal and communal development based on lifestyles that are peaceful, democratic, and sustainable.

In ***Case Study 5.10*** *Learning About Energy Efficiency* provided opportunities for young people to become change agents for sustainability. In future years they will show leadership and advocacy to address climate change and energy efficiency in universities, offices and homes, and they will help to shift understanding and actions to promote energy saving.

In ***Case Study 5.11*** *The Dutch Learning for Sustainable Development Program* helps professionals and individuals to identify and make sustainable choices throughout their lives. It specifically seeks to ***change government*** by demonstrating how agencies can play a leading role in prioritising sustainability, in taking strides towards sustainable operational management and in promoting public dialogue and engagement in sustainable development.

In ***Case Study 5.12*** The *Sustainability and Education Academy* activities ultimately seek to create a more knowledgeable public who can understand the issues that emerge and will be more willing to undertake the changes necessary to address sustainability issues.

In ***Case Study 5.13*** The *Literature and ESD Project* from Jamaica embeds an ethic of social responsibility into the experiences of trainee teachers. It introduces them, as well as the schools and communities they link to, to sustainable practices.

Increasingly, notions of building social capital or capacity for 'transition' feature prominently in the goals of ESD programmes. The notion of 'transition' considers the need for social adaptation to address current and future socio-economic and environmental realities. It involves civil society, governments and professionals in projects which illustrate social practices which are more clearly aligned with sustainability. These projects' impacts are assessed in terms of whether these 'demonstration' initiatives have influenced mind-sets and social practices.

Economic change

A large number of the case studies documented in Section 5 of this literature review sought economic change outcomes (see Box 4.3). These varied from improving the employability prospects of young people, to seeking cost reductions in operational management, to providing incentives and/or skills to develop local economies. Many of these initiatives also sought improvement in the management of existing human, financial and natural resources, with the aim of reducing environmental impact as well as expenditure.

Interestingly, there was a clear sense across these initiatives that it is important to develop economic literacy alongside environmental literacy. The need to change current models of economic practice and not just pursue further economic development in line with existing models also underpinned the ESD programmes featured. New economic models which were more responsible towards people and environments were often explored as part of these initiatives. Such programmes often offered an opportunity for stakeholders to consider commercial ventures aligned with sustainable development (e.g. organic farming or ecotourism). Capacity-building for economic change was a common feature of most programmes and this involved the development of new skills and experiences to support more sustainable forms of development. The capacity-building components supported individuals and groups to change their own practices as well as those of the systems within which they operate.

Box 4.3 Contributions of ESD to sustainable development: Economic change

Contributions to economic change	New economic models	Employability	Cost reductions; Savings	Support for local/ regional economy	Better management of resources	New Knowledge
Case Study 5.1 *The Rous Water Early Childhood Water Aware Programme*			Contributes to economic savings in centres and homes due to reduced water consumption	Contributes to local economy through purchasing of water tanks and landscaping supplies	Better management of water resources which resulted in reduced consumption rates	
Case Study 5.2 *The SISC Projects: Community Empowerment for Sustainability*		Enables individuals to tap into better employment opportunities in locality (e.g. organic food processing, ecotourism)		Contributes to improving local economic conditions through better management and access to new employment opportunities	Contributes to improvements in structures and processes such as allocation and management of resources or control of the local economy	
Case Study 5.3 *The Pacific ESD Framework*		Contributes to the creation of partnerships between schools, community and business to support young people following leaving formal education This contributes to increase retention of skilled Pacific Islanders and addresses youth unemployment		Contributes to a prosperous economy for the region based on sustainable development principles	Contributes to improved resource management across a range of sectors	
Case Study 5.4 *Learning for Social Entrepreneurship in Egypt*	Contributes to a social entrepreneurship business model which demonstrates that it is possible to be both financially competitive and committed to social justice	Provides opportunities to young people in excluded situations. For example, AYB-SD trains poor communities in Old Cairo on sewing skills, leather making and handicraft production. Zaytoona, which turned into a social venture in 2007, hires the best trainees				

Contributions to economic change	New economic models	Employability	Cost reductions; Savings	Support for local/ regional economy	Better management of resources	New Knowledge
Case Study 5.4 *Learning for Social Entrepreneurship in Egypt*	Contributes to a social entrepreneurship business model which demonstrates that it is possible to be both financially competitive and committed to social justice	Provides opportunities to young people in excluded situations. For example, AYB-SD trains poor communities in Old Cairo on sewing skills, leather making and handicraft production. Zaytoona, which turned into a social venture in 2007, hires the best trainees				
Case Study 5.4 *Learning for Social Entrepreneurship in Egypt*	Contributes to a social entrepreneurship business model which demonstrates that it is possible to be both financially competitive and committed to social justice	Provides opportunities to young people in excluded situations. For example, AYB-SD trains poor communities in Old Cairo on sewing skills, leather making and handicraft production. Zaytoona, which turned into a social venture in 2007, hires the best trainees				
Case Study 5.5 *ESD Quality Criteria*					Contributes to better management of resources in schools	
Case Study 5.6 *The MESA Partnership of African Universities*					Contributes to better management of resources in Universities	
Case Study 5.7 *The Japanese Corporate Social Responsibility (CSR) Project*					Participating companies have strived to improve their resource management as a result of the project	Contributes to new economic models in business that align with sustainability

Contributions to economic change	New economic models	Employability	Cost reductions; Savings	Support for local/ regional economy	Better management of resources	New Knowledge
Case Study 5.8 *The Czech Multimedia Toolkit*						Basic economic terms and concepts are outlined so that they could be used as the basis for a dialogue: nvironmental economics, environmental transport and the principles of sustainable production and consumption are the focus of attention. Students of the Faculty of Economics are involved in the process of contributing to the knowledge base.
Case Study 5.10 *The Learning About Energy Efficiency*		The skills and understanding generated by this project, applied in the development of engineering education and across industries, contributes to more employable graduates	Contributes to significant economic savings through reducing energy consumption		Improved use of energy is a contribution of this project	
Case Study 5.11 *The Dutch Learning for Sustainable Development Program*			Through embedding sustainability in the structure and administration of organisations (such a s government) generated savings through limiting resource consumption		Contributed to more responsible social and economic decision-making which involved improved resource management.	
Case Study 5.12 *The Sustainability and Education Academy (SEdA)*		Contributing indirectly through improving opportunities for students to be economically literate citizens, consumers, employees and leaders.			Contribution to sustainable management of human, physical and financial resources	

Environmental change[27]

Few of the ESD programmes reviewed measured their success in terms of environmental outcomes. There was a common understanding that there is a need to change the way we think and act to address unsustainable development. Therefore, most programmes sought primarily socio-economic or educational outcomes as it was understood that this would lead to environmental change in the long-term (e.g. Case Studies 5.5; 5.6; 5.12).

Nevertheless, many of these initiatives did make direct and indirect contributions to environmental change. These contributions ranged from improving environmental management practices of schools and universities; to protecting biodiversity and natural resources in small rural communities; to changing the consumer choices of shoppers; to reducing the environmental impact of businesses; to the adoption of environmental friendly technologies in government; to improving environmental health in excluded communities; and to reducing ecological footprints and vulnerability to climate change (See Box 4.4).

Much has been written about the relationship between education (or learning) and environmental outcomes and impacts (for example, Fien et al. 1999; Warburton 2008; Barratt Hacking et al. 2010). Many organisations which have conservation, biodiversity and environmental objectives at the heart of their missions seek environmental action and change and see education as an important platform for achieving these outcomes (see DEWHA 2010 as an example). It is important to note that there is widespread recognition that the achievement of these outcomes depends on processes of participation, inquiry and social learning which challenge existing unsustainable frameworks and practices, rather than the transmission of knowledge or the training of individuals and groups to behave in particular ways (Warburton 2008).

27. The term 'change' is used here in its broadest sense and refers to changing unsustainable practices which threaten life and biodiversity. It acknowledges that in some instances, the term environmental preservation or protection would be most appropriate.

Box 4.4 Contributions of ESD to sustainable development: Environmental change

In ***Case Study 5.1*** The *Rous Water Early Childhood Water Aware Programme* improved water management and water quality practices in centres and homes. Its secondary sustainability outcomes include, for example, better waste management and erosion prevention.

In ***Case Study 5.2*** *The SISC Projects: Community Empowerment for Sustainability* improved environmental conditions, for example by improving protection of ecosystems, watersheds and biodiversity.

In ***Case Study 5.3*** *The Pacific ESD Framework* strives to address environmental challenges such as biodiversity, conservation, water management, and plastics use and is focused on environmental improvements. It has promoted programmes such as 'Live & Learn's Rivercare' which seeks improvement in basin management; and the Sea Turtle Conservation Project which promotes reusable cloth shopping bags through local retail outlets to reduce plastic bag use.

In ***Case Study 5.4*** *Learning for Social Entrepreneurship in Egypt* is supporting the adoption of innovative technologies, new products and alternative business practices which are marketable on a global scale and respect the environment. Social entrepreneurs are aware of the environmental impacts of their activities and seek creative ways to reduce this impact.

In ***Case Study 5.5*** The use of *ESD Quality Criteria* has led to water and air monitoring, biologic and fair trade products marketing, and CO2 reduction campaigns across schools. In one particular instance it contributed to the recovery of an abandoned forest which now provides exercise areas, a botanical garden, informed walks and picnic areas. It also contributed to improved energy management and consumption in schools. In other situations, it has contributed to the refurbishment and maintenance of school building and grounds. One school involved pupils, and their teachers, architects and experts working together to re-build the school in more sustainable ways. They took into account sustainable resource management but also the design of spaces that could foster collaboration and participation through learning.

In ***Case Study 5.6*** The *MESA Partnership of African Universities* has made some tangible contributions to sustainability practices at local level. University lecturers report practical outcomes from some of their research initiatives at a community level, and student and management interventions are improving campus management.

In ***Case Study 5.7*** The Japanese ***Corporate Social Responsibility (CSR) Project*** resulted in strategic and management changes which improve the sustainability performance of businesses in and beyond Japan.

In ***Case Study 5.9*** ***ESD for Peace*** contributed to positive environmental change across the communities it worked with, for example, piping an open sewer that ended in Rincón Grande de Pavas and proper treatment of the sewage; creation of natural parks for community recreation.

In ***Case Study 5.10*** The ***Learning About Energy Efficiency*** project contributed to meeting key governmental priorities on climate change and energy efficiency. It contributed to reducing exploitation of natural environmental resources such as oil and gas; to introducing and promoting more sustainable energy sources and energy efficient technologies, to serve the wellbeing of future generations. Improving environmental management practices of future managers and engineers working in the oil, gas and metallurgic sectors of Kazakh industry also helps to encourage the use of more sustainable sources of energy and reduction of negative impacts on the environment;

In ***Case Study 5.11*** ***The Dutch Learning for Sustainable Development Program*** is contributing to water/climate adaptation; renewable energy; bio fuels and development; CO2 capture and storage; biodiversity; food and meat; sustainable construction and renovation.

In ***Case Study 5.12*** The ***Sustainability and Education Academy*** is making a contribution to reducing the school system's ecological footprint; modeling sustainable practice for the public and other government bodies; using its enormous purchasing power to make green products and procedures more affordable to the general public; influencing sustainable design and construction practices: for example, one of the new buildings in a SEdA board has been chosen as the most energy efficient school in Canada and will represent the country on an international platform.

In ***Case Study 5.13*** The ***Literature and ESD Project*** from Jamaica generated environmental initiatives such: creating green spaces in schools - turning a central barren, usually littered, area into a 'green space'; starting a small school garden growing different vegetables; introducing the recycling of plastic bottles and bags in schools.

Educational change

Some of the initiatives reviewed targeted pupils and students; employees; civil servants or community members, and built their capacity to contribute to change (see Box 4.4). The majority of the initiatives, however, adopted a systemic approach to change, seeking to challenge existing educational systems, structures and/or practices, not just the knowledge and ability of learners to engage with sustainable development. The reorientation of education was seen as a core goal of these programmes. In other words, the contribution or success of these ESD initiatives was measured in terms of the extent of educational change that had been achieved.

The need to align education systems and practices to sustainable development is recognised as a priority by the DESD (UNESCO 2005). This consists of:

i) the adoption of new ways of thinking about teaching and learning (see Case Studies 5.1; 5.6; 5.11; 5.12);

ii) the active engagement of the learner in an exploratory learning process which builds capacity as well as knowledge (see Case Studies 5.4; 5.7; 5.12);

iii) changing education policy and curricula (see Case Studies 5.10; 5.5);

iv) changing the professional development of facilitators and the education of teachers (see Case Studies 5.2; 5.11; 5.12);

v) creating a culture of organisational learning and change towards sustainable development (see Case Studies 5.6; 5.11; 5.12);

vi) creating a culture of social learning where informal contexts provide; and,

vii) opportunities to extend understanding of, and engagement with, sustainable development (see Case Studies 5.11; 5.12).

A smaller number of the programmes reviewed appear to have adopted a holistic approach to change. Case Study 5.1 provides an example of how an ESD programme contributed to challenging adult and child mindsets which exploit the environment at one level. At another level it challenged teachers to adopt sustainability education thinking and pedagogies and to contribute to changing mainstream education practice in early childhood education centres. Similarly, Case Study 5.11 provides another example of the adoption of a 'whole system' approach, seeking to transform the education system so that it does not rely on traditional forms of academic learning. It also encourages social learning, which it sees as important for the development of reflexivity and change, and focuses on building the capacity of educators and facilitators

through building social learning communities. Finally, it provides support for organisational learning and change across the education system, including the government ministries that support it.

The shifting of pedagogical approaches rather than the embedding of core sustainable development content in the curriculum were key outcomes sought by many of the initiatives reviewed (see Box 4.5). Another frequent feature of these initiatives was the emphasis they placed upon the creation of learning partnerships. For example, Case Study 5.11 sought to engender a learning society in which people learn from, and with, one another, so that they become collectively more capable of withstanding setbacks and dealing with the insecurities, complexity and risks associated with sustainability issues (see also Case Studies 5.5; 5.10).

Barratt et al.'s (2010) research on sustainable schools suggests that ESD has a critical impact on school improvement and in raising standards and improving the well-being of those engaged in the school. These effects appear to result from the ways that sustainable schools engage young people in the process of learning, improving their motivation and their ability to learn, whilst also promoting healthy school environments. Evidence also suggests that sustainable school initiatives help to advance community cohesion by linking stakeholders in enhancing the relevance of learning during school, creating better attitudes to learning and therefore greater enjoyment (Gayford 2009).

None of the case studies reviewed directly sought behavioural outcomes. As mentioned in Section 2, the language of 'behaviour change' is contentious (Knight, 2005) and the effectiveness of simplistic strategies aimed at changing behaviour is questioned by some ESD literature and the approaches adopted in these Case Studies. For example, Case Study 5.5 'ESD Quality Criteria' clarifies how ESD can contribute to an understanding that sustainable development is most effectively achieved through democratic citizenship processes rather than attempts to force compliance and behaviour modification.

Box 4.5 Contributions of ESD to sustainable development: Educational change

Educational changes	Individuals	Community groups	Professional groups	Organisations	Systems
Case Study 5.1 *The Rous Water Early Childhood Water Aware Programme*	Contributed to challenging adult and child mindsets that lead to wasting environmental resources and limit others' access to this resource		Contributed to teachers engaging with sustainability education thinking and pedagogies	Challenged mainstream education practices in early childhood education centres	
Case Study 5.2 *The SISC Projects: Community Empowerment for Sustainability.*		Contributed to cultural specific learning opportunities within community contexts			
Case Study 5.3 *The Pacific ESD Framework*	Contributed to improving ESD experiences of individuals	Contributed to building competencies of educators and learners so that they can engage in ESD			Challenged education system to promote innovation, research, creativity, inclusivity, collaboration.
Case Study 5.4 *Learning for Social Entrepreneurship in Egypt*	Contributed to building capacity of young people to seek new and alternative ideas and put them into practice	Contributed to the promotion of innovation, creativity, collaboration of youth in tackling SD issues			
Case Study 5.5 *ESD Quality Criteria*	Contributed to an understanding that SD is more a matter of democratic citizenship than compliance and behaviour modification issue. It interprets ESD as a life-long learning process and it assists learners to make a difference in their schools and communities			Contributed to small but visible changes in decision-making and action-taking relating to sustainability	

Educational changes	Individuals	Community groups	Professional groups	Organisations	Systems
Case Study 5.7 *The Japanese Corporate Social Responsibility (CSR) Project*			Participants indicated real improvement in their understanding of SD and ways to advance employees' learning in this area.	Contributes to developing an organisational learning approach to SD and CSR issues.	
Case Study 5.10 *The Learning About Energy Efficiency*	Contributed to understanding and actions associated with energy saving. Also promoted new ways of thinking empowered students to be change agents for sustainability				Contributed to a new subject "Energy Efficiency & SD" supported by the Ministry of Education and Science and is being introduced into the Higher Technical Education System of Kazakhstan
Case Study 5.11 *The Dutch Learning for Sustainable Development Program*		Contributed to social learning by bringing stakeholders together to explore notions of SD		Contributed to social and organisational learning. It is helping, for example, civil servants acquire the insight and skills needed to make responsible ecological, social and economic decision-making.	It is seeking to transform education and promote the use of social learning in universities. Not just rely on traditional forms of academic learning. It is important to develop foundations necessary for reflexivity and change.
Case Study 5.12 *The Sustainability and Education Academy (SEdA)*	Contributes to developing capacity of educators and education leaders to contribute to SD.			Contributes to changes in education policy, curriculum, teaching, learning, professional development	Contribute to reorienting the education system from one focussed on development to one prioritising sustainability

In brief

The ESD literature has only recently begun to feature evaluative studies that map the outcomes, outputs and impacts of ESD projects and programmes. The case studies written for the purposes of this review and documented in Section 5 therefore provide important opportunities to assess these types of contributions in greater detail than is possible from studying the experiences documented in existing literature[28]. Analysis of the case studies reveals that changes are being nurtured at several levels (social, economic, environmental and educational), although the effects and issues are often intertwined.

28. Please note that with the exception of Case Study 5.1, the case studies provide reflective analysis rather than empirical evidence arising from evaluations.

05
Case studies

The review of international literature provided a context within which to interpret ESD experiences in relation to processes and learning. However, key to addressing the two core questions of this study[29] was an analysis of existing ESD programmes, projects and frameworks from different countries and regions of the world.

There are exemplary programmes captured in sustainable development publications as well as education books and journals. The documented experiences rarely provided answers to the core questions of this study. For this reason, a number of programme directors, project leaders and/or evaluators were approached and asked: to reflect on what constitutes ESD processes and learning; and, how ESD is contributing to sustainable development. These reflections informed the direction of the literature review and were captured through thirteen cases studies. The experiences provide a context for, and often culturally specific analysis of ESD in practice.

The case studies capture a range of experiences which include early childhood education; school education; youth education; and university education as well as community learning; business learning; institutional learning; government learning; and partnership learning programmes. They cover a range of thematic areas including: water; peace; traditional knowledge; social entrepreneurship; corporate social responsibility; production and consumption; health; biodiversity and conservation; land-management practices; unemployment; community development; social justice and educational development. Regional, strategic and operational ESD frameworks also figured amongst the case studies. The case studies were sourced from various regions of the world and are listed below:

Case Study 5.1 The Rous Water Early Childhood Water Aware Programme, New South Wales Australia

Case Study 5.2 The SISC Projects: Community Empowerment for Sustainability, South West China

Case Study 5.3 the Pacific Education for Sustainable Development Framework, Pacific Region

Case Study 5.4 Learning for Social Entrepreneurship in the Middle East: Alashanek Ya Balady Association for Sustainable Development, Egypt

Case Study 5.5 ESD Quality Criteria for Schools, ENSI International Network

29. These related to clarifying: what are appropriate ESD learning processes?; and, how does ESD contribute to sustainable development? (See P.4).

Case Study 5.6 Mainstreaming Environment and Sustainability Education in African Universities: A Partnership Programme

Case Study 5.7 Corporate Social Responsibility (CSR) Project, Tokyo, Japan

Case Study 5.8 EnviWiki: The Czech Multimedia Toolkit for Education for Sustainable Development

Case Study 5.9 ESD for Peace: A Community Development Program, San José, Costa Rica

Case Study 5.10 Learning about Energy Efficiency in the Higher Technical Education System of Kazakhstan

Case Study 5.11 Learning for Sustainability: A National Government Programme for Change, the Netherlands

Case Study 5.12 Sustainability and Education Academy (SEdA), Canada

Case Study 5.13 Literature and Education for Sustainable Development – A Graduate Course, the University of West Indies, Jamaica

CASE STUDY 5.1

The Rous Water Early Childhood Water Aware Programme

New South Wales, Australia[30]

Australia is the driest continent on Earth, regularly challenged by drought. Even in times of 'good rain', all communities are concerned about water security and emerging threats from climate change. In northern New South Wales, Australia, ***Rous Water*** - the regional water supply authority - has implemented education programs to supplement its work in water supply and management. One of these is its ***Early Childhood Water Aware Centre Program***, designed specifically for children and their families, and staff and management committees in early childhood education services (Birth-5 years), such as long day care centres, kindergartens and preschools.

In 2007, the programme was evaluated[31]. The study showed that important changes were made to learning and teaching and to water and resource use as a result of the program, and that benefits have been be sustained and expanded over time.

A. What learning processes are appropriate to ESD?

The Rous Water Early Childhood Water Aware Programme:

- Is underpinned by a 'sustainability' framework which enables learners to see 'the big picture' with regards to water issues.
- Links Thinking to Practice - water-saving messages are promoted at both educational and operational levels. In other words, the programme practices what it preaches.

30. Case study drafted by Dr Julie Davis, Queensland University of Technology.

31. Davis et al. 2008.

– Tackles the Whole – The programme involves all members of a centre's community - children, teachers, managers and parents.

– Uses ESD pedagogies which place the learner at the centre of learning and teaching, for example:

At the level of children:

- ***Active Learning:*** Stories, songs, and puppetry actively engage the children and help them learn to become 'water-watchers'.
- ***Application:*** Learning is then scaffolded by teachers who apply the learning to problem-solving – e.g. how to water the garden without a hose.

At the level of the educators:

- ***Active Learning:*** Teachers are encouraged to explore, expand and reflect on their approaches to teaching sustainability.
- ***Application***: Teachers are supported professionally with innovative curriculum and pedagogical ideas and resources, enabling them to continue the work after the program's initial introduction.

At the level of the centre managers:

- ***Active learning:*** Managers become engaged in a water audit to understand their centre's current water usage.
- ***Application:*** Managers become involved in developing an action plan to support ongoing water conservation measures specific to their centre's needs.

At the level of the parents:

- ***Active Learning:*** Parents are encouraged to reflect and change their water practices at home by the impetus of their children's learning.
- ***Application:*** The learning above is reinforced with the provision of appropriate and timely resources, such as information/ brochures from the local council/ water authority to encourage action taking.

B. How is ESD promoting and facilitating sustainable development?

The early childhood water education programme makes a contribution in four areas:

- Social: children are empowered as change agents for sustainability – they show leadership and advocacy for water conservation in their centres and homes; they help their parents 'unlearn' water-wasting habits and attitudes;
- Educational: uptake by teachers of sustainability education thinking and pedagogies;
- Environmental: improved water management and water quality practices in centres and homes; secondary sustainability outcomes include, for example, better waste management and erosion prevention; and
- Economic: economic savings in centres and homes due to reduced water consumption; some economic injections into the local economy through purchasing of water tanks and landscaping supplies.

Most importantly, the programme contributes to challenging adult and child mind-sets that lead to wasting or over- exploiting environmental resources and that limit others' access to this resource. It also challenges mainstream education practices in early childhood education and lays early foundations in citizenship for sustainable development.

CASE STUDY 5.2

The SISC Projects: Community Empowerment for Sustainability

South West China[32]

The Shangri-la Institute for Sustainable Communities (SISC) is a locally managed NGO that has been working with communities around the area of Shangri-la in southwest China for more than 13 years. SISC facilitates community based learning and empowerment projects with the goal of building communities that are ecologically sustainable, economically viable and socially just, within China.

A. What learning processes are appropriate to ESD?

At the individual level:

Knowledge – The project seeks to build knowledge relevant to the local cultural context through active learning approaches which address the community's needs and interests. This includes an exploration of Tangka painting, Tibetan medicine, local birds, plants and history.

Skills – The project provides opportunities for community members to learn:

i) traditional skills e.g. traditional farming; land management practices e.g. how to look after river and mountains;

ii) critical thinking skills which helps with decision-making and reasoning when confronted with issues;

iii) technology skills e.g. solar power, biogas;

iv) creative thinking skills which helps them with problem-solving; and with,

v) adapting/responding to change.

32. Drafted by Yunhua Liu, Director of Shangri-la Institute for Sustainable Communities.

Values – The project encourages learners to reconnect with local culture and deep belief systems. Community members explore these through music and dance, oral histories, painting and worship of sacred mountains and lakes. The project encourages an exploration of values such as: frugality (common in China's 3 main philosophies: Buddhism, Daoism and Confucianism)**;** harmony and interconnectedness: with nature, the family, community, nation and beyond; self-cultivation; respect for diversity and plurality; a sense of spiritual wealth as opposed to material wealth.

At the institutional level: The project provides opportunities for learning at the institutional level. It has supported the work of six local NGOs in institutional capacity-building especially in the areas of participatory project planning and implementation. It is also helping to establish new community organizations e..g the development of a Community Nature Reserve (CNR) and eight Community Learning Centres (CLC). The project supports processes and organisations which promote collective wisdom, voices and action in the communities.

At the social level:

Learning partnerships – The project links formal and informal learning settings and thus connects people in villages with others working in nature reserves, living in monasteries or nunneries as well as teachers and pupils in schools.

Learning Platforms – The project provides learning platforms in the communities which it serves. These platforms include training courses at Community Learning Centres which help with setting up community based projects such as organic farming, eco-tourism and local culture preservation.

Key to the Success of the Project are several guiding principles:

- Participation: community setting the agenda and driving the process;
- Rooted in local context: social/cultural (religion, belief), environmental, economic and political;
- Respect diversity and plurality;
- Action-based: seeks tangible results in environmental, social, economic and political spheres; and,
- Reflexivity: praxis, learning by doing, adaptive, reflective.

Community engagement and participation in learning is taking place at different levels across the project. However, it is always rooted in the local context, and based on community needs and aspirations. The project sees this

as key to promoting and facilitating ESD. It provides opportunities to empower local communities to achieve better social, economic, environmental and political conditions.

B. What contribution is learning making to sustainable development?

Empowerment facilitates changes at three levels: the individual level (enhancing knowledge, skills and commitment); the institutional level (richer wisdom, bigger voices and more effective action) and the social level (connecting with broader social, economic and political structures and processes, reflecting together on common values). The learning process has thus contributed to:

- Improved environmental conditions - better protection of ecosystems, watersheds, biodiversity.
- Enhanced social capital - protection of traditional practices, and indigenous knowledge. The project has served to maintain traditions and traditional learning as well as local languages. It has inspired communities to protect their cultural and natural heritage.
- Improved economic conditions - improved skills, knowledge and values lead to sustainable use of local resources and ability to tap into better employment opportunities in locality (e.g. organic food processing, eco-tourism). It has also resulted in improvements to structures and processes such as allocation and management of resources, coordination or control of the local economy.
- Higher levels of Participation (democracy) - improved confidence amongst community members which has led to develop and discuss common values that are more in line with sustainability which in turn has led to improvement of livelihoods.

CASE STUDY 5.3

The Pacific Education for Sustainable Development Framework: Pacific Region[33]

The Pacific countries are very diverse and are at different stages of engaging with ESD. However, they face common sustainable development issues such as rising sea-levels due to climate change, cultural erosion and rising unemployment.

In 2006, the Ministers of Education endorsed the Pacific Education for Sustainable Development Framework as a mechanism to assist with strengthening a regional approach to sustainable development, and engaging Pacific countries in learning processes for sustainable development. It was seen as a contribution to the UN DESD.

The Pacific ESD framework was developed through multi-stakeholder engagement and involved a working group consisting of representatives from government, community, regional, international and private organisations from across the Pacific.

The Pacific ESD framework is informed by a vision of sustainable development which is transformative and inclusive. It is to be implemented at the national level by governments through incorporation into national policies and strategic planning documents. It is based on three priority areas for action which are considered as the key issues facing the Pacific: (i) formal education and training; (ii) community-based education; and (iii) policy and innovation.

33. Case study drafted by Ingrid Mulà Pons de Val, International Research Institute in Sustainability (IRIS).

A. What learning processes are appropriate to ESD?

The Pacific framework is underpinned by an approach to ESD which:

- works with people-based perspectives;
- seeks collaboration and partnership;
- supports capacity-building processes;
- builds on existing initiatives and incorporates innovation and creativity;
- incorporates cultural and intergenerational learning;
- takes into account the needs of remote, rural and outer islands.
- is based on the "think global, act local" principle;
- uses information and communication technologies effectively;
- Addresses all education sectors and involves all possible stakeholders: educators, researchers, business sector, policy makers, NGOs, community leaders, influential group; and,
- measures progress and involves stakeholders in evaluation mechanisms which contribute to adapt the framework when is needed.

B. What is the contribution of learning to sustainable development?

The Pacific Education for Sustainable Development Framework contributes to the four following areas:

- Social: The framework empowers learners and policy-makers to contribute to sustainable development through capacity-building processes. It promotes development in a way which is culturally sensitive and acknowledges the importance of taking into account local needs. The framework also acknowledges the importance of indigenous and local knowledge to achieve more sustainable practices.

- Educational: The framework extends existing educational practice so that it questions unsustainable development. It challenges education so as to promote innovation, research, creativity, inclusivity, collaboration and long-term strategic planning. It does this through building the competencies of educators and learners so that they can engage in learning for sustainable development.

- Environmental: The framework is striving to address environmental challenges such as biodiversity, conservation, water management, and plastics use. Some educational programmes are already being implemented following the framework's principles. For example, recognising the role of young people in managing future environmental issues, Live & Learn's Rivercare programme promotes action-based and discovery learning by students, teachers and communities. An another example involves SPREP in a project on sea turtle conservation promoting reusable cloth shopping bags through local retail outlets to reduce the use of plastic bags.

- Economic: The framework is seeking to involve the business sector and community leaders in change for sustainability. Through education it aims to promote a prosperous economy for the region based on sustainable development principles. The ESD Workshop in Nadi on 21-22 September 2006 identified key projects that should be further developed. For example, creating partnerships with schools, community and the business sector to support young people through the transition process following leaving formal education. This would increase retention of skilled Pacific Islanders, address youth unemployment and build an employment base.

The success of the framework will be judged on the creation of partnerships and collaboration systems amongst the diverse stakeholders from the Pacific Region to deliver improved outcomes for achieving a sustainable future.

CASE STUDY 5.4

Learning for Social Entrepreneurship in the Middle East

Alashanek Ya Balady Association for Sustainable Development, Egypt[34]

Egypt faces many socio-economic challenges regarding sustainability. As in many other countries in the Middle East, in Egypt there is a high percentage of young people who are unemployed. The lack of promising career trajectories and limited economic opportunities are currently amongst the most complex challenges that young people are facing in the whole region. Recognising this challenge, governments, civil society organisations and the business sector have already started to create new employment opportunities for young people in this region. However, there is a need to develop new models which empower and extend economic and social benefits to excluded and non-excluded young people. Social entrepreneurship provides the platform in which these models can be built upon, and in which, young people can be inspired to create more sustainable futures.

This case study is centred on the Alashanek Ya Balady Association for Sustainable Development (AYB-SD) and is informed by ***Social Entrepreneurship in the Middle East: Toward Sustainable Development for the Next Generation***[35]**.**

AYB-SD is a youth-led organisation and social entrepreneurship in Egypt. Using a sustainable approach, this association develops different types of projects and programmes for poor communities. Its projects are focused on training and employment, microcredits, community and participation, and cultural and health awareness. The association works within a unique twin system and financial sustainability. AYB-SD provides social ventures that create both social impact and financial sustainability for the organisation. The facilitators of the programme adopt a twin system for financial sustainability, where each development programme in the organization has got a twin social venture. This social venture generates profits to pay off the operation costs of its corresponding programme.

34. Case study drafted by Ingrid Mulà Pons de Val, International Research Institute in Sustainability (IRIS).

35. The Report which was supported and funded by Middle East Youth Initiative, Wolfensohn Center for Development at Brookings, Dubai School of Government and Silatech in 2010. The report featured the AYB-SD Project as a good example of social entrepreneurship for sustainable development.

A. What learning processes are appropriate to ESD?

The social entrepreneurship model adopted:

- seeks collaboration and partnership amongst a wide range of stakeholders: governments, NGOs, business, education, health, and media sectors. It involves them in business activities as well as policy-making;
- seeks to build a culture that promotes social entrepreneurship through involving leaders, policy-makers and the private sector;
- promotes strategic social partnerships and viable inclusive business models;
- addresses local and community problems;
- promotes innovation which can be adapted/"scaled up" beyond the local context;
- is transformative as it develops human capital;
- has a social mission and addresses core social values;
- promotes the development of skills and competences of future social entrepreneurs; as well as creativity and critical thinking;
- encourages the development of new fields of knowledge and concepts to be shaped and debated;
- involves all education sectors and stages of educational life;
- highlights community-based learning and extra-curricular activities; and,
- supports and integrates indigenous knowledge and technology.

B. What is the contribution of learning to sustainable development?

AYB-SD and the Social Entrepreneurship in the Middle East report contributes to the four following areas:

- Social: The social entrepreneurship model adopted demonstrates commitment to values and social mission. It responds to communities that have been marginalised or excluded by existing market actors and non-market institutions. It offers alternative opportunities and empowers young people in situations of social exclusion. For example, AYB-SD Cultural and Health programmes for poor communities and families is financed by Tafanin which promotes social responsibility through art and culture. Tafanin addresses community issues through social responsibility campaigns and offers marketing opportunities for companies and businesses.

- Educational: Social entrepreneurship promotes innovation, creativity, collaboration and inclusivity. It promotes collaborative and community-based learning to tackle sustainability issues. Learning is always linked to seeking new and alternative ideas and put them into practice.

- Environmental: The project seeks to create innovative technologies, new products and alternative business practices which are marketable on a global scale and respect the environment. Social entrepreneurs are aware of the environmental impacts of their activities and seek creative ways to reduce this impact.

- Economic: The project is based on a social entrepreneurship business model which demonstrates that it is possible to be both financially competitive and committed to social justice. It provides opportunities to many young people in excluded and non-excluded backgrounds and situations. For example, AYB-SD trains poor communities in Old Cairo on sewing skills, leather making and handicraft production. Zaytoona, which turned into a social venture in 2007, hires the best trainees from AYB-SD training programme.

CASE STUDY 5.5

ESD Quality Criteria for Schools ENSI International Network [36]

This project proposes 'quality criteria' for schools in Education for Sustainable Development and is championed through a publication[37]which has been translated into 17 languages and adapted by schools in several European countries.

The Quality Criteria in ESD project was underpinned by research emerging from SEED[38] - a COMENIUS III project facilitated by the ENSI network[39]. The point of departure was a collection of national reports from 13 OECD countries[40] on implicit and explicit criteria guiding the Eco-schools development processes which seek change at the institutional level. Twenty-eight 'programmes' involving over 3500 schools were collected and analysed[41] to inform the selection of quality criteria.

The project proposes 3 main 'scenarios' for teaching and learning on sustainable development:

a. Scenario 1: 'a science and technology driven future' – which sees learning as the transfer of knowledge;

b. Scenario 2: 'a new relations with nature driven future' - where learning is seen mainly as a challenge and teaching as a facilitation process; and,

c. Scenario 3: 'a social change driven future' - where learning is seen as a social process and teaching as an introduction to democratic dialogue. This 3rd scenario is seen as the most relevant to ESD.

The publication supports Scenario 3 and presents an educational philosophy for school development in ESD.

36. Case study drafted by Dr. Michela Mayer, Italian UNESCO Commission for DESD,and Dr. Finn Mogensen, University College South Denmark.

37. 'Breiting, Mayer & Mogensen (2005) '*Quality Criteria for ESD-Schools*'.

38. '*School Development through Environmental Education*' (SEED).

39. www.ensi.org, the publications quoted can be downloaded from the website.

40. 11 European as well as Australia and Korea.

41. Mogensen & Mayer (2005).

A. What are appropriate ESD learning processes?

The project proposes ESD learning processes which are: student - centred, collaborative and participative.

The project promotes learning strategies which engage learners in:

a. futures thinking - asking children to imagine and compare long term effects of their choices;

b. systems thinking and complexity- aware of a new culture of 'complexity' where students and teachers prepare themselves 'to expect the unexpected and to deal with it';

c. critical thinking - asking for a critical thinking open to the language of possibility; and,

d. values clarification - inviting for value clarification and for the acceptance of other values and cultures, demanding a personal 'taking action' attitude.

The project promotes 'whole system change'. The third scenario engages not only students but also teachers, headmasters, school community and ESD educators who are asked to enter in a reflective learning process. The intention is to clarify next steps which will improve the quality of teaching and learning for sustainability.

The Quality Criteria act as starting points for stakeholder dialogue with the intention of engaging parents, teachers, pupils, government agencies, private bodies as well as communities in plans for change towards sustainable development.

B. How does ESD promote sustainable development?

Underpinning the Quality Criteria Project is an understanding that sustainable development is more a matter of democratic citizenship than compliance and behaviour modification issue. It interprets ESD as a life-long learning process and it assists participants to make a difference in their schools and communities.

The Quality Criteria Project did seek *'visible outcomes at school and in the local community'* that education for sustainable development was taking place. This meant looking for small but visible changes in decision-making and action-taking relating to sustainability:

> In Korea, the pupils and school teachers led a project which involved the parents and the entire local community in the recovery of an abandoned forest near the school. The forest was transformed for community and educational use and included exercise areas, botanical garden, informed walks, picnic areas;
>
> In Austria, a group of lower secondary pupils analysed school energy consumption patterns and generated a set of recommendations for improving energy use and consumption. The recommendations were accepted by the school management but also by the local authorities and led to changes in practices;
>
> In Italy, the need to refurbish and maintain school building and grounds was seen as an opportunity to involve students in ESD thinking. Pupils, and their teachers, collaborated with architects to re-build the school in more sustainable ways. They took into account sustainable resource management but also the design of spaces that could foster collaboration and participation through learning.

Quality Criteria asks schools to *'become institutions active in society',* recognized as relevant stakeholders in the development of Community. Schools following the criteria have been actively involved in community activities as water and air monitoring, biologic and fair trade products marketing, CO2 reduction campaigns.

CASE STUDY 5.6

Mainstreaming Environment and Sustainability Education in African Universities: A Partnership Programme[42]

The Mainstreaming Environment and Sustainability in Africa's (MESA) Universities partnership[43] is designed as UNEP's contribution to the DESD. It works with the African Association of Universities, UNESCO, and a broad partnership network to infuse environment and sustainability concerns into universities in Africa. The initiative responds to various commitments to sustainable development in Africa including: the Millennium Development Goals (MDGs); the African Ministerial Conference on the Environment (AMCEN): and the New Partnership for Africa's Development (NEPAD).

Since its inception in 2004, MESA has adopted a broad based understanding of ESD and learning. At one level the MESA programme promotes ESD as a learning process in itself (i.e. a meta-learning view of ESD), and at another level, it introduces new approaches to learning within an ESD framework (introducing pedagogical innovations).

A. What are appropriate ESD learning processes?

- MESA is a transdisciplinary initiative which involves university teachers and lecturers from all university disciplines. It encourages an understanding of how individual disciplines can contribute to ESD, but also, and perhaps more importantly how transdisciplinary knowledge creation is possible at the level of practice where sustainability issues are experienced in communities, schools and in the day-to-day production and consumption practices in society.
- MESA actively encourages the development of partnerships and networks amongst universities, business, government, civil society

42. Drafted by Akpezi Ogbuigwe, UNEP and Heila Lotz-Sisitka, Rhodes University, South Africa.

43. See www.unep.org/training

and community partners, recognising that learning for sustainability requires a diverse range of views and different knowledge modalities in society.

– MESA learning also takes account of both the local and the global dynamics of knowledge creation and sustainability practices, and actively encourages university lecturers to engage with local and indigenous knowledge as well as the latest information available from scientific reports, and other information resources.

– MESA engages a reflexive learning and professional development model which locates the learning of lecturers, student participants and university managers in their own 'change project' contexts. This model encourages situated learning of how to go about mainstreaming environment and sustainability in African universities.

These four learning strategies develop MESA capacity for learning in new ways that broaden constructions of knowledge, ways that take account of the transdisciplinary nature of sustainability learning, and ways that recognise multiple sources and modalities of knowledge in the learning process.

B. How did the learning promote and facilitate sustainable development?

– MESA recognises that ESD contributes to a *'learning society'* in which people learn from, and with, one another. They become collectively more capable of withstanding setbacks and dealing with sustainability-induced insecurity, complexity and risks (a social learning view of ESD).

– ESD is seen and practiced as a *process of reflexive change* – involving change in the way knowledge is viewed, produced and used in universities, and change in the way universities function in society as 'learning hubs' providing opportunities for engagement in sustainability issues and risks.

– MESA has been premised on a concept of ESD innovations, and all of its activities support university teachers and professors to learn more about sustainable development and ESD in various ways (i.e. there is no one recipe).

- It seeks to support university lecturers and managers to see that a sustainable society will require new ways of thinking about teaching, learning and knowledge in universities, and that universities need to support social learning processes, and not just traditional forms of academic learning, although these too are important to build the knowledge foundations necessary for reflexivity and change.

Through these educational activities, there are some tangible contributions to sustainability practices at the local level – university lecturers report practical outcomes from some of their research initiatives at the community level, and student and management interventions are improving campus management. Some outcomes that are emerging include:

- a commitment to situated learning,
- a commitment to networked learning,
- a commitment to learning in communities,
- a commitment to fostering dialogue and life-long learning that promotes global solidarity, rather than international competitiveness.

It is, however, the longer term societal contributions to sustainable development that are of interest to MESA – in the form of integrating knowledge and practice of sustainable development into a range of societal practices.

CASE STUDY 5.7

Corporate Social Responsibility (CSR) Project, ESD Research Centre, Rikkyo University

Tokyo, Japan[44]

Reorienting business practice to support more sustainable patterns of development is important and requires the building of business expertise to deal with the complexity of sustainability issues. The Corporate Social Responsibility (CSR) Project in ESD, led by the ESD Research Centre of Rikkyo University, addresses this need by working with innovative ESD approaches across a wide range of businesses.

The project involves: i) the identification of innovative CSR activities within Japanese and overseas businesses; and, ii) a series of participatory sessions, discussions and retreats which assist businesses to improve their planning and skills in the area of CSR. ESD learning processes underpin the project which attracts the interest of business executives, shareholders and employees. Key companies involved include: Kumagai gumi (large construction company); Panasonic (electric appliances); Shiseido (cosmetics); Tokyo Electric Power Company (energy); Hakuhodo (advertising agency); Kosaido (printing/IT). A key project outcome is the publication *'Guidelines for Sustainability Education within a CSR Context' (2010)*.[45]

A. What are appropriate ESD learning processes?

– Participatory learning: Participatory learning underpins all the key activities within the interactive symposium and workshop series, in order to: avoid one-way knowledge transfer; to maximise capacity-building; and, to share expertise. This approach helps participants

44. Case study drafted by Dr Ko Nomura, Nagoya University, Japan and Alex Ryan, University of Gloucestershire, UK.

45. The guidelines is available (in Japanese) at: http://www.rikkyo.ac.jp/research/laboratory/ESD/csrkyouikujisedai.pdf

to develop a broad understanding of the principles of ESD and sustainable development, and to build their skills in bringing this into the widest possible range of CSR plans and strategies.

– Multi-stakeholder engagement: Taking an approach that engages multiple stakeholders is critical, as business activities involve, influence and depend upon a wide range of agents and organisations across societies. The process of developing guidelines during the project has been informed by input from a wide range of stakeholders, so that diverse views have been included about the objectives and priorities of those involved in business.

– Applied learning: The project works by bringing 'real-life' business experiences into engagement with sustainable development and CSR issues. The process was designed to provide applied learning opportunities for the participants and to develop better guidelines by including input from diverse examples of CSR in action, in real business strategies, functions and contexts. One participant who had previously regarded ESD and CSR as too idealistic stated that the workshops had enabled him to think about these areas in concrete ways.

B. How did the learning promote and facilitate sustainable development?

The project worked with ESD approaches to support and improve sustainable development within business, by addressing various aspects and challenges:

– Educational: The initial symposium and all ongoing activities promoted the aims and value of ESD to participants, to create understanding about how these learning processes can help in applying sustainable development principles within a CSR context and to business practice in general.

– Practical: The development of guidelines during the project provides concrete ways to support all those involved in business to make connections and bring sustainable development into their own areas of work. Recognising the abstract and complex nature of the concept of sustainable development, the guidelines were developed with a simple, clear structure, to increase their usability.

– Integrated: The guidelines were created with seven pillars: one aim, three viewpoints and three approaches. The aim was 'creating opportunities in tough times by actively working towards sustainability'. The three viewpoints emphasised were: inter-generational justice/fairness; intra-generational justice/fairness; and fair relations between humans and nature. The three approaches highlighted were: creating values through multi-stakeholder dialogue; participatory learning; and appreciating local/indigenous knowledge.

This is an ongoing project and plans are in place for larger-scale training workshops in coming years, based on the guidelines that have been developed. Although it is too early to formally assess the project's impact, participants indicated *real improvement in their understanding* of concepts of sustainable development, *ways to put it into practice* in relation to CSR and ways to *advance employees' learning in this area*.

CASE STUDY 5.8

EnviWiki – the Czech Multimedia Toolkit for Education for Sustainable Development [46]

The Czech Republic is situated in Central Europe where there is a history of environmental problems due to the intensively industrial and totalitarian communist regime which gave little thought to sustainable development. The situation has rapidly changed after (i) the Velvet revolution in 1989 as a result of democratic dialogue with representatives of civic society and (ii) later in the context of the EU accession in 2004 when investments were made in new technologies.

Democratic dialogue is the key to supporting ESD programs focused on critical thinking, a constructivist approach and active learning strategies. The EnviWiki project, which started in 2005, seeks to promote this dialogue. EnviWiki is an interdisciplinary and multi-media toolkit available on the internet (http://www.enviwiki.cz).

This toolkit is used as a resource in courses at the Czech Technical University, the University of Economics, Charles University in Prague, the Agricultural University and the Institute of Chemical Technology [47] and involves experts from different fields of expertise, including the economic, environmental, social and political.

A. What are appropriate ESD learning processes?

Knowledge about sustainable development issues is gained through an active exploration of issues by students. Through independent work and engagement with this multi-media kit, students learn about sustainable development themes and also develop the skills necessary for participating in sustainable development processes.

46. Case study drafted by Dr Jana Dlouhá, Prague Environment Centre, Charles University.

47. These five universities, based in Prague, have signed the Agreement on Cooperation in Education for Sustainable Development.

The ESD learning processes are:

- learning to search for information relevant to the topics of interest and contributing to the knowledge base;
- developing a "holistic" view which is built on exploring the perspectives of different disciplinary backgrounds;
- developing critical thinking and enabling students to investigate various perspectives;
- learning to formulate questions and re-formulate ideas, building on them and amending them through personal contribution;
- developing team skills and learning to exchange experiences with students from different backgrounds;
- learning to understand complexity and to address sustainable development through understanding main trends and factors in a global context;
- learning a multi-dimensional approach – attention is focused on the exploration of interrelationships: a non-linear reading of the reality.

The tool also encourages disciplinary dialogue wich occurs on different levels. Various types of stakeholders can benefit and contribute to the academic knowledge base and also be involved in discussions related to the themes. Students of different disciplines meet in virtual space and are able to build upon each others' contributions. Within one course, they comment and review the work of the others and experience their work as building a community involved in a common project.

B. How does ESD promote and facilitate sustainable development?

The principle of a social web, using wiki, contributes to the development of interdisciplinary, multi-stakeholder and participatory thinking, and supports community building through engagement in the process of knowledge creation.

Specifically, the ESD process used by this multi-media tool contributes to the following outcomes:

Economic: basic economic terms and concepts are outlined in a way that is understandable for lay public so that they could be used as the basis for an

interdisciplinary dialogue and be utilised by teachers at lower levels of the educational system as well. Environmental economics, environmental transport and the principles of sustainable production and consumption are the focus of attention. Students of the Faculty of Economics are involved in the process of contributing to the knowledge base, and interlinking their contributions to the environmental and social part of it.

Environmental: basic environmental terms and concepts are outlined as well; students of the Institute of Environmental Science contributed with their part. An Environmental Education Wikibook is available for students of the Pedagogical Faculty; these students worked on educational concepts such as Green Schools or Forest Pedagogy.

Social: globalisation processes with their impact on human and social life are described – this part of the knowledge base is used in the Globalisation courses run for the students of all 5 Prague universities.

Educational: challenging dominant educational practice so that it is reoriented towards the attainment of sustainable development, especially by using active learning strategies and a constructivist approach in education at the university level. Students can familiarize themselves with the basic concepts of the environmental, economic and social pillars of sustainable development and thus "operationalize" this concept for interdisciplinary understanding and practical considerations within policy-making processes on different levels (local, regional, global).

CASE STUDY 5.9

ESD for Peace: Community Development Program

San José, Costa Rica[48]

Rincón Grande de Pavas is one of the most densely populated marginal urban communities in San José, Costa Rica, with a reputation as being one of the city's most violent communities. The programme described here sought to address these issues through community learning and development. It formed part of the ***Program for the Culture of Peace and Democracy in Central America*** [49]of the United Nations University for Peace and was collaboration with the seven governments of Central America.

Fifteen communities from across Central America participated in this programme.

These communities had been involved in the civil wars and/or suffered from socioeconomic exclusion and confronted myriad social and developmental challenges. The Program[50] supported these communities through diverse educational and cultural activities and then shared practices that had exemplary educational value through networks of communicators.

A. What learning processes were used in the project contributing to its success?

– A Holistic Conceptual Framework: The Programme was based on an Integral Model of Peace Education which supported human rights, particularly: The Right to Peace, The Right to Development, and The Right to a Healthy Environment. In 2000 The Earth Charter was used as an integral expression of the holistic interrelationship of these three spheres.

48. Case study drafted by Dr. Abelardo Brenes, Special Advisor Earth Charter Initiative.

49. The project was carried-out from 1997-2001.

50. The work in Rincón Grande de Pavas was also part of a government initiative supported by U.N. Habitat to support the development of marginalized communities.

- Pedagogy, an Educational Triangle: At the local level learning activities were carried-out with three main actors: a) community members; b) primary and secondary level schools; and c) journalists representing print, radio, and television agencies. Some of the activities sought to foster cooperative relationships between these groups in order to promote *The Development Plan of Rincón Grande de Pavas*; transform the negative social image of Rincón Grande de Pavas and foster a consciousness that their exclusion was a responsibility of all citizens of Costa Rica; and disseminate expressions of their emerging culture of peace and democracy through the mass media.

- Integral Model of Peace Education: The model is a person-centered conceptual framework which considers 'peace' as a state of integrity, security, balance, and harmony, conditions needed for self-realization. It assumes that each person lives within three relational contexts: a) with oneself; b) with others; c) and within nature. Violence or peaceful living is addressed within each. A culture of peace needs to be constructed simultaneously in all these contexts on ethical, mental, emotional, and action levels. Educational actors reflect on the processes of globalization and their implications for local development. Strategies were incorporated into the plan to resist globalizations negative challenges and to take advantage of its constructive potential to forge models of personal and communal development based on lifestyles that are peaceful, democratic, and sustainable.

B. How did ESD promote and facilitate sustainable development?

During the year 1997, the Program cooperated with diverse governmental institutions in Costa Rica, by applying the Integral Model of Peace Education in workshops for the development of the Strategic Local Development Plan for Rincón Grande de Pavas. In January of 1998, the Program also supported the community in achieving a commitment on behalf of this plan, through community forums. Their commitments to the Strategic Local Development Plan meant a substantive transformation in the political culture of urban marginal communities in Costa Rica, which remain divided through a political party patronage system in which community leaders act as brokers to obtain housing and other services from the winning party.

During 1998-99, work focused on collaborating with the community in the development of non-violent action strategies, with the support of certain journalists, to pressure the new government in meeting its commitments towards the development plan. As a consequence of these activities, Rincón Grande de Pavas became the first urban-marginal community in Costa Rica in which a new social policy called 'Solidarity Triangle', was carried-out. In this policy, representatives of a community, of the central government and of the respective municipal government (in this case, the Municipality of San José), negotiate projects and government subsidies. The training that the community leaders received in negotiation and non-violent strategies was applied in these negotiations. The result was an agreement to develop ten infrastructure and social projects. Community leaders declared that this result helped them realize that, ultimately, the use of non-violent strategies was more effective than the use of violence, which had been the traditional way of pressuring governments. Several of these projects had a significant environmental dimension. For example, one called for piping an open sewer that crossed San José and ended-up in Rincón Grande de Pavas, including the creation of a park overhead and proper treatment of the sewage.

A significant indicator of its local and national impact was an incident which took place in October, 2000. A serious clash took place between youth groups and the police. Mediation was carried-out by community leaders who had been trained by the program. A fundamental shift in how such incidents were reported by the media was exhibited. For example, ***La Nación***, the main Costa Rican daily newspaper instead of stigmatizing the youth groups and the community (which was the traditional way of reporting) focused on the structural causes of violence that affected youth in Rincón Grande de Pavas and similar communities. It also appealed to the shared responsibility that all sectors of Costa Rican society, including national and local government, had in finding solutions for the inhabitants of Rincón Grnde de Pavas and other similarly marginalized communities.

CASE STUDY 5.10

Learning about Energy Efficiency in the Higher Technical Education System of Kazakhstan[51]

The project '*Education for Sustainable Development & Energy Efficiency*' for the Higher Technical Education System of Kazakhstan was implemented in 2008-09 by CAREC, in cooperation with Company Chevron and SGP GEF UNDP. It promoted ESD in the pilot university, Kazakh National Technical University[52] (KazNTU) by introducing a Bachelor-level ESD course and developing recommendations for cross-curricular integration of SD themes at KazNTU.

The speed of industrial development in Kazakhstan has created the need for a new generation of engineers with expertise in sustainable energy technologies. In Central Asia, education is given strategic emphasis as key to addressing environmental degradation and resource depletion. Kazakhstan's *"Concept of Transition of Kazakhstan for Sustainable Development for 2007-2024"* (2006) reflects ESD principles and approaches as critical to meeting key governmental priorities on climate change and energy efficiency. The country's unique geopolitical positioning means that it also benefits from ESD initiatives arising in both the United Nations Economic Commission for Europe (UNECE) and the Asia-Pacific region (APR).

A. What learning processes are appropriate to ESD?

The overall objective of the project was to integrate ESD principles and to promote new technological approaches in KazNTU as the pilot technical HE institution.

– ESD learning approaches were used during the project implementation:

51. Case study drafted by Tatyana Shakirova, Manager of CAREC ESD Program.

52. KazNTU – named after Kanysh Satpayev.

- Learning by doing,
- Learning together,
- Learning from each other,
- Learning for a better future,
- Learning for sustainability.

– Personal responsibility: From the outset, the university teachers were fully involved in the project activities, participating in the development of the new course and its electronic textbook, writing the Methodological Guide for teachers and taking part in the introduction of the course at KazNTU.

– Awareness-raising and capacity-building: KazNTU teachers and students became more actively engaged in sustainable development (SD), climate change and sustainable energy (SE) issues via a series of training activities.

– Connecting Theory and Practice: The project effectively combined theoretical knowledge (seminars and training for teachers and students on SD, climate change and energy efficiency) with practical activities (on-site competition for student pilot projects on energy saving and energy efficiency).

– Networking National and Regional Stakeholders: The CAREC network on ESD made dissemination of the project results possible across the Higher Technical Education system in Kazakhstan (via an additional Methodological Seminar for technical universities) and more widely in Central Asia (via the 8th Sub regional Conference on ESD organized by CAREC in 2009).

– Tackling the Whole: The project involved the widest range of stakeholders within Kazakhstan, from the Ministries of Education and Science, Ministry of Environmental Protection, to teachers and students at the pilot university, as well as the NGOs Baiterek, EcoObraz, EcoCenter-Karaganda, Otrazhenie, international organizations such as CAREC and SGP GEF UNDP, plus the business sector of Kazakhstan, through Company Chevron.

B. How is ESD promoting and facilitating sustainable development?

Educational: The new subject area of "Energy Efficiency & SD" was supported by the Ministry of Education and Science of Kazakhstan and is now being introduced into the Higher Technical Education System of Kazakhstan. The experiences from this pilot project have been disseminated across the Higher Technical Education system of Kazakhstan via the Republic Methodological Seminar. There has also been improvement in levels of cooperation between educational (Ministry of Education and Science) and Environmental (Ministry of Environmental protection) sectors due to participation in the project. The awareness-raising and capacity-building among KazNTU teachers and students continues to expand, with new ways of sustainability-focused thinking and decision-making guiding the future generations of Kazakh managers and engineers.

Environmental: Students of the Technical Higher Education System of Kazakhstan will be the future managers and engineers working in the oil, gas and metallurgic sectors of Kazakh industry. Their new knowledge and competences will lead to changes in behavior and decisions on issues of sustainable energy, energy efficiency and the introduction of renewable energy sources in Kazakhstan. This will lead to informed decision-making and help to reduce negative impacts on the environment.

Social: Through educational opportunities, young people are empowered as change agents for sustainability. In future years they will show leadership and advocacy to address climate change and energy efficiency in universities, offices and homes, as well as helping to shift understanding and actions to promote energy saving.

Economic: The skills and understanding generated by this project, applied in the development of engineering education and across industries, contributes to significant economic savings.

The most important and immediate effect of this project is to contribute to challenging the citizens of Kazakhstan to reduce exploitation of natural environmental resources such as oil and gas, and to introduce and promote more sustainable energy sources and energy efficient technologies, to serve the wellbeing of future generations.

CASE STUDY 5.11

The Dutch Learning for Sustainable Development Program[53]

The 'Learning for Sustainable Development Program' (LfSD) is a cooperative venture between six national government ministries, the association of provincial authorities and the association of water boards. The programme commenced in 2004 and built upon a strong foundation of collaboration between the Dutch Government and other professional groups concerned with environment and development issues.

The LfSD programme helps professionals and individuals to identify and make sustainable choices throughout their lives. It does this through social learning – an approach which:

- involves stakeholders in an exploration of the concept of sustainable development;
- brings stakeholders together to engage with sustainable development issues (e.g. through workshops, networks, websites for sharing and co-creating knowledge);
- offers training, coaching and peer review to support thinking and practice for sustainability (e.g. offering support for embedding sustainability in the structure and administration organisations).

A. What learning processes are appropriate to ESD?

The Learning for Sustainable Development Program has three pillars:

Pillar 1: ***Learning individuals*** **-** this aims to ensure that all school-leavers and graduates are able to make an active contribution to sustainable development. The programme targets educational

53. Case study drafted by Machtelijn Brummel, program Learning for Sustainable Development, Agentschap NL.

institutes, teachers and lecturers, and administrators in all sectors of education: primary, secondary, higher and professional education (within the education sector) and the organisations that support the education sector in the area of sustainable development (outside the education sector).

Pillar 2: ***Learning organisations*** aims to help civil servants acquire the insight and skills needed to make responsible ecological, social and economic decision-making and prevent responsibilities being shifted (the global dimension) or put off. The main target group is the public sector (national and regional).

Pillar 3: ***Learning society*** is primarily aimed at provinces. Working towards a sustainable society concerns us all, also at provincial and regional level. Local authorities (provincial councils, municipal councils, district water boards), businesses, community organisations and citizens are involved in interactive policy-making processes. The provincial network of Learning for Sustainable Development directors allocates resources (money and expertise) to facilitate that voyage of discovery and make the results accessible to others.

Approaches such as action research, storytelling and learning that is increasingly focused on direct experiences, real-life projects, working and learning trajectories are adopted.

B. What contribution is learning making to sustainable development?

Since 2008 a national strategy for sustainable development is in place. The 'Cabinet Approach to Sustainable Development' (KADO) has three interconnected tracks:

1. seeking improvements in thematic areas: water/climate adaptation; renewable energy; bio fuels and development; CO2 capture and storage; biodiversity; food and meat; sustainable construction and renovation;
2. changing government and demonstrating how agencies can play a leading role in prioritising sustainability but also in taking strides towards sustainable operational management;
3. promoting public dialogue and engagement in sustainable development.

In this approach the role of education and learning is made explicit. Investing in education, sustainable professional skills and the learning capacity of society at large is seen as a key factor in becoming a society that functions more sustainably. The program learning for sustainable development is mentioned in the KADO-strategy as one example of a recent success story. Additional efforts in the areas of knowledge development, skills and competences will be needed to realise the ambitions and drive the message home.

This involves social learning and engaging the civil society, as well as training and facilitating professionals in the government and in the educational system to start the transition towards a sustainable Holland.

CASE STUDY 5.12

Sustainability and Education Academy (SEdA)

Canada[54]

One of the major deterrents to ESD moving forward in formal education is the lack of understanding of ESD among senior education leaders and decision makers. As the DESD was being launched in 2005 it was apparent that the ESD movement in Canada was stalled at the whole school approach. In 2006 the Sustainability and Education Academy (SEdA) was created to address this concern.

SEdA is as a collaborative program between: The Schulich School of Business[55]; The Faculty of Education at York University; The UNESCO Chair in Education for Sustainable Development; and Learning for Sustainable Future (LSF) in Canada. This executive education program is designed *"To inspire leaders to create a culture of sustainable development integrated into all aspects of the K to 12 education system – policy, curriculum, teaching, learning, professional development, and the sustainable management of human, physical and financial resources."* [56]

The flagship offering of SEdA is the Education Leader Seminars[57] Each Seminar is a 2½ day intensive, residential, informative and motivational event for about 50 senior education leaders. Seminars provide participants with the models, tools, and strategies needed to transform school board and ministry culture toward ESD. The following target groups have participated in the Education Leader Seminars:

- School Boards: directors; deputy directors; area superintendents; curriculum superintendents; managers of business, finance and buildings; principals; trustees and other key system roles.
- Provincial Ministries of Education: deputy ministers; assistant deputy ministers; special advisors; and curriculum directors.

54. This case study was drafted by Prof Charles Hopkins- co-founder and Dr Brian Kelly, co-chair SEdA.

55. Recently ranked as Number 1 business school in the world at teaching sustainability.

56. SEdA Mission Statement: 2010, page 1.

57. In addition SEdA is developing concepts for further resources for its target group such as: an In-Service Workshop for graduates of the SEdA Seminar; a checkpoint meeting for board representatives; case studies of leading jurisdictions; an Alumni Network for peer exchange; specialized seminars for particular groups such as First Nation educators; and, a web portal for access to various resources.

– University Faculties of Education: deans; associate deans; and professors.

A. What ESD learning processes underpin SEdA?

SEdA is supported by processes which are considered best practice in ESD. The Academy provides:

– a holistic overview of the social, economic and environmental issues facing learners and the possible approaches to engaging with, or responding to, the issues through education;

– using an interactive learning approach that respects the knowledge and skills that exist within the adult learners and engages the learner actively in the process;

– opportunities for all to learn including the faculty (i.e. those facilitating SedA). It is not a "training" process;

– engaging the entire system of leaders (whole-system approach) including ministry of education, University faculties of education and the school system leaders as learning teams;

– opportunities for learning from experiences outside the education system: bringing together leaders from other sectors and even parts of the world to share their experiences and perspectives;

– an emphasis on learning for rather than simply about a sustainable future;

– an emphasis on applying the learning - the teams leave the seminar with action plans they have created. These plans address minor to profound change from curriculum to estates and include new transportation policies, custodial practice, food policy and purchasing policy; and,

– addressing the underlying societal values and implications for building sustainable futures.

B. How does ESD contribute to sustainable development

SEdA is seeking to transform education systems and practice so that education is able to make a contribution to *"prepar(ing) today's students to take their places as ecologically, socially and economically literate citizens, consumers, employees and leaders in Canada and global society"*[58].

Senior education leaders are mostly aware of the ongoing need for education reform but reorienting to address sustainability issues was previously "under their radar". Having the senior leaders of the wider education process hold a systemic review and institute integrated change is intended to achieve several goals:

- reorient the education system from one focussed on *development* to one focused on *sustainable development;*
- create a more knowledgeable public who would understand the issues that emerge and would be more willing to undertake the changes necessary to address the issue;
- create a value set and a basic understanding of the principles of sustainability that will provide a foundation for their life-long learning processes.

In addition, SEdA is making a direct contribution to sustainable development:

- by reducing the school systems ecological footprint;
- by modelling sustainable practice for the public and other government bodies;
- by using its enormous purchasing power to make green products and procedures more affordable by the general public;
- training local construction workers in sustainable building practices: e.g. one of the new buildings was identified as the most energy efficient school in Canada.

58. SEdA Vision (2010 p.1).

CASE STUDY 5.13

Literature and Education for Sustainable Development – a graduate course, the University of the West Indies

Jamaica[59]

'Literature and Education for Sustainable Development'[60] is an elective course offered to graduate students at the School of Education, The University of the West Indies, Jamaica. The course begins with an examination of the concept of ESD and with an analysis of key local and global sustainability issues. It explores and analyzes through literature a number of sustainability concerns. Students are taught to read a variety of texts eco-critically. Based on this, they then identify a sustainability concern in their community, develop and implement a plan to address this. Some of these community action projects have included: addressing violence through literacy, learning to manage waste, creating green spaces and school gardens. Additionally, students explore ESD pedagogies for change.

The course is seeking to develop:

i) awareness and knowledge of sustainability issues (local to global);

ii) an ESD lens through which reading texts are studied;

iii) greater appreciation for literature's relevance to sustainability;

iv) awareness of ESD pedagogies amongst new teacher education students;

v) development of systems thinking, critical thinking and problem-solving skills often attributed to ESD;

vi) a closer interaction between academic studies and the communities they serve; and,

vii) action projects in community (e.g. literacy for peace, school gardening).

59. This case study was drafted by Dr Lorna Down, Teacher Educator at The University of the West Indies, Jamaica.

60. The School of Education, University of the West Indies, Mona, Jamaica, West Indies.

A. What ESD processes underpin the programme and contribute to its success?

- Ongoing examination of, and reflection on, the concept of sustainability;
- Promotion of basic understanding of systems: (i) of recognizing literature as part of the cultural capital and related to all aspects of the ecosystem – built, institutional, human, natural capital and (ii) understanding the interconnectedness of the physical, social and economic;
- Development of critical literary skills, of interpreting texts through eco-critical readings/with an ESD perspective. Reading the literary texts include exploring representations of the physical environment in relation to its socio-economic and cultural aspects. Broadening concept of texts to include 'real', 'every day' physical, social and economic texts ;
- Identification of literature's added value to the curriculum and working through that for sustainability e.g. literature's emphasis on the affective, on attitudes and values, on multi-perspective interpretations;
- Linking study of texts to taking action. The literary works provide an opportunity for deeper connectedness of academia to community. Greater interface between academia and society as boundaries between classrooms and communities become more flexible. Community action projects form the basis of this.

B. How is ESD contributing to sustainable development?

- Deepening awareness of sustainable development (and its complexities) and what makes for sustainable societies;
- Developing pedagogies for change, for addressing sustainability problems;
- Developing critical reading/interpretation skills (understanding of Ecocriticism, of reading ecocritically) and related critical thinking skills;

- Promoting greater connectivity between academia and society; developing universities' responsiveness to the needs of society;
- Deepening project based learning & community service learning;
- Re-envisioning education to emphasize transformation of communities;
- Clarifying concept of teachers as change agents;
- Ensuring that community action is integral to the curriculum;
- Developing ethics for social responsibility[61] through introducing school and other communities to sustainable practices (related to the physical, social and economic dimensions of sustainability). For example:
    - Creating green spaces in schools: This has involved turning a central barren, usually littered area into a 'green space'. A graduate student worked with her class in a secondary school to achieve this;
    - Creating peace through literacy: A graduate student 'taught' peace through teaching literacy to primary school students in an inner city community;
    - Starting a small school garden: A graduate student worked with parents and students to start a small school garden growing different vegetables;
    - Recycling plastic: A graduate student introduced to school community recycling of plastic bottles and bags;
    - Introducing HIV/AIDS education to young people at a church community: A graduate student, despite the Church's 'restrictions', through a mini course, focuses on attitudes and values related to relationships and to practical knowledge of HIV/AIDS.

61. Down, L. (2009).

06
Conclusion

A key objective of this literature review is to gather information to inform the choice of tools and the specific questions which need to be asked to guide the 2011 DESD monitoring and evaluation report. This final section provides suggestions arising from the present review, to contribute to the design and conduct of the Phase II review of progress on processes and learning for ESD:

Processes and learning for ESD

The Phase II monitoring and evaluation process is seeking to assess progress towards ESD by reviewing processes and learning opportunities in ESD.

The review has identified that certain key processes underpin ESD frameworks and practices. These include:

- processes of collaboration and dialogue (including multi-stakeholder and intercultural dialogue);
- processes which engage the 'whole system';
- processes which innovate curriculum as well as teaching and learning experiences; and,
- processes of active and participatory learning.

'Learning' for ESD refers to what has been learnt and is learned by those engaged in ESD, including learners, facilitators, coordinators as well as funders. Often learning is interpreted as the gaining of knowledge, values and theories related to sustainable development but, as this review indicates, that ESD learning also refers to:

- learning to ask critical questions;
- learning to clarify one's own values;
- learning to envision more positive and sustainable futures;
- learning to think systemically;
- learning to respond through applied learning; and,
- learning to explore the dialectic between tradition and innovation.

The information provided by this review can be used to map where ESD is taking place across the globe, by assessing the content and processes underpinning such initiatives. There is often a tendency to map issues covered by ESD initiatives when in fact, `here is also a need to review the processes underpinning these activities.

This study has exemplified processes and learning opportunities as they occur in different contexts and settings around the globe, through consulting the literature but more importantly through the comparative analysis of themes and approaches undertaken in specific case studies of ESD initiatives.

One critical lesson learnt through the review process is that it is difficult to access data on ESD processes and learning opportunities as these are rarely documented in sufficient detail in the literature. There is an abundance of information available about the specific objectives and outcomes of projects, but a noticeable lack of data to show how these objectives and outcomes are achieved. This relatively new field is only at the very earliest stages of generating the type of comparative and evaluative overview that provides a picture of effective processes and approaches. The study thus recommends that during Phase II i) data collection processes focus on actual experiences rather than reviews of the literature; and ii) data collection tools are based on tightly-focused questions that will capture greater detail about learning processes and learning opportunities.

This study has identified a number of common processes and learning approaches associated with ESD across a range of global settings and quite diverse initiatives. This understanding of existing trends within ESD will guide the analysis of data collected during the Phase II monitoring and evaluation process. The findings also suggest that any reviews of practice should not be limited only to those programmes and initiatives named as 'ESD'. Often ESD can occur in contexts or initiatives not labeled as education or perceived as learning processes, and the effects of projects that share these common aims and approaches are often more far-reaching than those traditionally understood as the 'target audiences' for educational interventions. Indeed, many sustainable development initiatives have learning components contained within them which have not often been captured in the literature to date and this is an important lesson for future reviews of effective practice.

One critical question remains at the core of the present review, which relates to the extent and the depth of connection between the choice of processes in ESD initiatives and actual contributions to sustainable development. In other words, is there a direct relationship between processes and outcomes in ESD? Given that the level of evaluative assessment within the literature is in its infancy, and given that the outcomes themselves are so varied and feature at multiple levels, it is not possible to provide clear-cut answers on the basis of this review of literature. However, external review of case study findings, anecdotal evidence from individual programme evaluations and the reflections of programme leaders seems to suggest that there are links that should be explored in more detail.

Contribution to sustainable development

It is perhaps too soon to report on the likely overall impact of the DESD. However, this review presents a timely opportunity to consider the areas in which change is emerging and the ways in which ESD appears to be contributing effectively to sustainable development.

The case studies reviewed in this document suggest that it is possible to map a wide range of contributions through ESD to economic, environmental, social (including cultural) and educational change. The review identifies and categorizes the range of potential contributions and some of the themes and priorities that are apparent across these key initiatives. It has not sought to document or validate the actual changes.

Section 4 presents a number of boxes (See 4.2; 4.3; 4.4 and 4.5) which map and thematise the range of contributions made by the featured ESD initiatives. These boxes could be adapted to serve as templates to provide a platform for collation and analysis of future data and to inform the analysis of the in-depth case studies that will be generated during Phase II of the DESD.

ESD remains poorly researched and weakly evidenced. This literature review has been informed mainly by programme or context-specific research studies and programme evaluations. However, there is a lack of meta-analysis studies or longitudinal research. This means there is not sufficient evidence to provide conclusive responses to the core questions that drive the present review and other similar investigations into the value of ESD as a field of research and practice. These challenges will also confront the Phase II monitoring and evaluation report as it attempts to provide robust and meaningful evidence of the impact of the DESD initiative as a whole.

07
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Additional Internet resources

Alashanek Ya Balady Association for Sustainable Development (AYB-SD): http://www.ayb-sd.org/

EnviWiki – the Czech Multimedia Toolkit for Education for Sustainable Development: http://www.enviwiki.cz/

Education for Sustainable Development Research Center (ESDRC), Rikkyo University, Japan: http://www.rikkyo.ac.jp/research/laboratory/ESD/; http://www.rikkyo.ac.jp/research/laboratory/ESD/eng/project/index5.html (ESDRC project team)

ENSI (Environment and Schools Initiative) www.ensi.org,

Sustainability and Education Academy (SEdA) http://www.SustainableEnterpriseAcademy.org

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Appendices

Appendix 1

Phase II of the Global Monitoring and Evaluation process

A Global Monitoring and Evaluation Framework for Phase II has been developed. This includes a rationale, identifies methods and provides structures for the data collection, analysis and reporting processes for the DESD at the global level. This Phase II framework builds upon the experiences, data as well as lessons learnt[63] from Phase I. It shares common goals with Phase I global monitoring and evaluation process. These include:

a. raising awareness amongst stakeholders about the DESD;

b. providing opportunities for reflection and learning;

c. monitoring progress across a range of sectors (e.g. formal education, community, government, business);

d. assessing changes (in processes and learning at Phase II)[64];

e. providing a regional as well as a global map of progress; and,

f. assessing the contribution of UNESCO to the DESD and the lessons learnt in the process of implementation.

The GMEF Phase I and II are underpinned by the major thrusts of ESD (see Appendix 2) and global milestones for the Decade (see Appendix 3) as identified in the DESD International Implementation Scheme (2005). Amongst others, the documents have been guided by the Bonn Declaration (see Appendix 4) which sets out a clear vision for ESD for forthcoming years within the context of the DESD; and, 'UNESCO's Strategy for the Second Half of the DESD' (2010) which acknowledges the critical role of monitoring and evaluation. The latter also emphasises the importance of celebrating good practice as well as the need for regional capacity building in monitoring and evaluation of ESD.

The 2011 report will focus on processes and learning in ESD[65]. The term 'processes' in this context, refers to engagement opportunities, pedagogical approaches or teaching and learning styles adopted to implement ESD in different levels and settings of education. 'Learning' for ESD refers to what

63. See Tilbury (2010) Appendix 1 for summary of lessons learnt from Phase I of the global M&E process undertaken between 2007-2009.

64. Phase I assessed changes in context and structures and Phase III will report on outcomes and impact.

has been learnt and is learned[66] by those engaged in ESD, including learners, facilitators, coordinators as well as funders.

The MEEG, at its November 2009 meeting defined the objectives of Phase II of the DESD M&E process as:

CLARIFICATION: To clarify which learning processes should be promoted to facilitate learning in ESD and to identify learning opportunities (projects, programmes or activities) in ESD that in turn promote and facilitate sustainable development;

1. RANGE AND DIVERSITY: To capture the range of levels and settings of education (formal, non-formal and informal), where the processes and learning for ESD are taking place;

2. ENGAGEMENT: To identify who is involved in the processes and learning for ESD (as providers, funders, recipients and beneficiaries) and to identify how the stakeholders mentioned are involved in the processes and learning in ESD);

3. INTENTIONS: To determine what existing processes for ESD aim to achieve – whether the processes have normative aims (for example, including ESD curricula) and/or learning aims (for example, increase and enhance the awareness of ESD and capacity-building of stakeholders);

4. CHANGE: To examine (i) what has started to change; (ii) what has been learnt in the process of reorienting education systems towards ESD; (iii) whether opportunities for ESD outside of education systems have increased; and, (iv) to what extent it is contributing to advancing sustainable development specifically in the context of processes and learning.

These objectives underpin the proposed framework. Other critical inputs are the recommendations enshrined in the Bonn Declaration (2009) which have also been considered as guiding principles in the development of the Phase II framework (see Appendix 4). The Bonn Declaration was developed in consultation with multiple stakeholders and thus provides a good basis for the development of the framework[67]

65. It is acknowledged that ESD is not often a stand-alone project or effort. ESD can be a strand or component of a sustainable development initiative.

66. This follows the advice of the MEEG as recorded in the MEEG Meeting which took place 20th Nov 2009.

Appendix 2

Components of the Global Monitoring and Evaluation Framework (GMEF) Phase II

At their November 2009 meeting the MEEG advised that Phase II should rely more on qualitative than quantitative data and that richer and deeper analysis of processes and learning was required. This, it was argued, would shape the Phase II framework and indicators (UNESCO MEEG 2009 p.2).

The framework for Phase II thus combines participatory monitoring, documentary analysis, self-reporting, expert evaluation, key informant analysis and stakeholder validation processes to increase opportunities for engagement as well as assure representation and validity of the data.

The following six components underpin Phase II of Global Monitoring and Evaluation Framework:

- an expert review;
- an ESD portal of experiences;
- a collection of case studies of ESD;
- a brief questionnaire for Member States;
- a key informant analysis; and,
- an internal assessment of UN Agencies contribution to DESD.

The expert review:

The purpose of the expert review review is to address the first objective of the Phase II which seeks clarification on: i) what are commonly accepted learning processes which are aligned to ESD and should be promoted through ESD activities; and, ii) which learning opportunities (projects, programmes or activities) in ESD promote and facilitate SD. This review is to be drawn through a variety of authoritative sources of literature from across the globe and would be validated by stakeholders through an on-line process. It will inform data collection as well as evaluation assessments undertaken as part of the case study analysis component of the GMEF Phase II.

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Caption: Agricultural class in field, fruits, farming specialist (Philippines)

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Caption: Class of adults (Mexico)

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Education for Sustainable Development (ESD) is a paradigm shift in education and goes beyond the traditional premise of education by providing individuals and communities, children and adults alike, with the savoir-faire to tackle the complexities of tomorrow today.

Within the framework of the Monitoring and Evaluation process for the United Nations Decade of Education for Sustainable Development (DESD, 2005-2014), this expert review aims to show which commonly accepted learning processes are aligned with ESD, and which should be promoted through ESD activities.

The review, through its variety of case studies, provides an opportunity to map where ESD is taking place across the globe thus presenting a well balanced picture of theory and practice. It also attempts to highlight what ESD-related learning opportunities contribute to furthering sustainable development.

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