The Future Fit Framework

An introductory guide to teaching and learning for sustainability in HE

Author: Professor Stephen Sterling.

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TEACHING & LEARNING SUSTAINABILITY WITH PLYMOUTH UNIVERSITY

Centre for Sustainable Futures

The Higher Education Academy

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> *Graduates are entering a volatile world and higher education needs to respond to challenging, rapidly changing socio-economic and environmental conditions.*
> HEFCE (2009, p7)

Q: Is higher education, and your university, and are your programmes and graduates 'future fit'?

Who is this Framework for?

Sustainability relates to just about everything, so if you think 'this is nothing to do with me and my subject area', we invite you to suspend judgement and read further ...

Sustainability and sustainable development concern ideas, understanding, values and skills that are highly relevant to today's society, economy and our environment – and to our individual and collective futures. So it's relevant to everyone, and to virtually all subject areas.

> *... it is increasingly recognised that education for sustainable development and research into a sustainable future are the most significant contributions that universities can make to the problems of sustainability.*
> Universities that Count Annual Report 2009-10

Here are some terms you may have heard:

- education for sustainable development (ESD);
- education for sustainability (EfS);
- education for a sustainable future;
- sustainability education.

They are broadly similar in meaning. But for ease of reference, we will use the term 'education for sustainable development' (ESD) as it is the one most often used. 'ESD' is also endorsed by government and international agencies such as UNESCO, which currently manages the UN Decade of Education for Sustainable Development (DESD) 2005-2014. There may be other equally valid terms used in your own subject area that touch on similar ground.

If you're curious about this rising agenda and dimension of education policy and practice – or at the beginning of your (or your institutional) engagement, or even a good way down the road – this Framework is designed to help you.

While this resource is primarily for academics – including curriculum and educational developers and practitioners – policy makers, senior managers and support staff who want to know more about ESD will also find it helpful.

The Framework is specifically about teaching and learning, and does not cover other areas where sustainability is relevant such as research, campus management and organisational change. While many universities have made strides with regard to greening their campuses, *embedding sustainability in curricula* has often been a harder challenge. This Framework aims to encourage and help facilitate this process.

The Framework was developed out of the experience of the Higher Education Academy (HEA) ESD Project, which ran from 2006-2011, and led the HEA's work on ESD. This work is now carried on as part of the HEA's overall programme, which identifies ESD as one of seven key priority areas.

How to use this Framework

- **The Framework is not designed as a 'cover to cover' read!** Everyone is busy, and some users will be more informed about sustainability education than others. Navigate to the section(s) that are of most interest or use. If you are already some way down the sustainability education road in relation to policy and/or practice, you can use this Framework to compare your existing work and help extend it.

- **The format – short texts, boxes, lists, links, etc. – is intended to allow quick accessibility** and facilitate use of the material in any way that is appropriate to the user's needs.

- **The concepts, ideas, models and discussion questions presented here are indicative**, and not in any way intended to be prescriptive or comprehensive. Sustainability, and education for sustainability, are still emerging, and are sometimes contentious fields of inquiry. So the material here is meant as a resource, to be used, tried out, interpreted, amended, critically discussed and, if useful to you, adapted as part of the individual and institutional learning process towards quality ESD provision.

- Any part of the Framework, and particularly the 'key points' and 'discussion Qs', can be used as a stimulus for reflection and/or used in **staff development**.

The Framework is specifically intended as an introduction. For more detail on any area, exemplars and help, please go to the Resources section.

Quick start:

Just refer to the Contents, and go to the sections that are of most interest and help to you.

Each section is shown by a navigation compass icon followed by a one-sentence summary of what the section contains.

Institutional use

Users are encouraged to adapt and adopt this Framework for use in their own institutions. While there is no copyright attached to the Framework, to encourage adoption, institutions are asked to credit this source fully.

Future revisions

Please help us make this Framework more useful and relevant by giving us your feedback: please see 'Feedback sheet' in Appendices. This will help us make improvements that will benefit everybody.

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1 Introduction

This section outlines the rationale for the Framework (1.1), summarises how sustainability education relates to existing HE agendas (1.2), reviews briefly the key concepts of education for sustainable development (1.3; 1.5) and sustainable development (1.4).

1.1 Why this 'Future Fit Framework'?

Do you identify with these statements?

- 'I'm really busy, I've no time to take anything else on board!';
- 'I've got enough agendas to deal with already';
- 'There's enough change going on in HE already'.

Probably ... but how about these too?

- 'I'm concerned for the future';
- 'I recognise that we need to prepare students for a rapidly changing society and uncertain future';
- 'I wonder if we do enough in this regard at our university or college?'

If so, you might welcome this introductory help guide on 'education for sustainable development' (ESD) or 'sustainability education'. While there is a good deal of material available in this area, it has been the experience of the Higher Education Academy ESD Project over recent years, that busy people want:

- some guidance on the nuts and bolts of ESD;
- a digest of key ideas;
- some pointers on next steps and resources.

Misconceptions

ESD is *not*:

- a separate subject or discipline;
- separate from and unrelated to other HE agendas such as employability, enterprise, quality and internationalisation;
- just about 'the environment';
- a passing fad.

If this could be you, please read on ...

1.2 What can ESD do for me?

Section 2 looks at 'Why bother?' in some detail. But in sum here – if you have never thought about sustainability education, or have only touched on it, there are a number of reasons to engage, or engage further:

- **Student interest:** HE is in a state of rapid change not least with regard to its funding base, where students will have much greater influence on provision. There is evidence that, increasingly, students are expecting HE institutions to address sustainability-related issues. According to an NUSS study for the HEA (Bone and Agombar 2011) 35% of first-year students said that the environmental credentials of their university were important in selecting a place to study, and just under 40% believed that how seriously their university took global development issues was important.

- **Relevance:** Sustainability education can be helpful by introducing immediate context (local, regional, global and 'in the news' relevance) to lectures, renewal of and diversity in pedagogic approaches, and better motivation among staff and students. It can make a major contribution to personal development planning (PDP) and building the kinds of graduate attributes that many HEIs currently aspire to.

- **Community links:** It is rich in potential with regard to both students undertaking placements, work experience and voluntary activity as a formal part of their course, and links between a university and the wider community including businesses or industry (local or national).

- **Quality agenda:** There is increasing interest in the links between the quality agenda and sustainability education, and the potential of the latter to raise performance and profile and help innovation.

- **Sustainability performance:** Many universities are striving to improve their sustainability credentials and performance as measured by the People and Planet Green League (http://peopleandplanet.org/greenleague) and the environmental and social responsibility scheme Learning in Future Environments (http://www.thelifeindex.org.uk/). Curriculum, teaching and learning are increasingly seen as a key part of these efforts.

- **Employers' views:** There is growing evidence that employers are seeking graduates with 'green' and 'sustainability' skills (BITC 2010) in relation to the low carbon economy, and uncertainty in socio-economic conditions.

1.3 But what *is* education for sustainable development (ESD)?

Key point: In essence, ESD is about the kinds of education, teaching and learning that appear to be required if we are concerned about ensuring social, economic and ecological well-being, now and into the future.

It carries the assumption that the quality and kinds of education, teaching and learning that we are engaged in have a direct bearing on this well-being, or quality of life, positively or negatively.

Here are some definitions:

> *Education for sustainable development (ESD) is a vision of education that seeks to balance human and economic well-being with cultural traditions and respect for the earth's natural resources.*
> (UNESCO undated)
> http://www.unesco.org/education/tlsf/extras/img/DESDbriefWhatisESD.pdf

> *ESD is about the learning needed to maintain and improve our quality of life and the quality of life of generations to come ... ESD enables people to develop the knowledge, values and skills to participate in decisions about the way we do things individually and collectively, both locally and globally, that will improve the quality of life now without damaging the planet for the future.*
> (Sustainable Development Education Panel Report 1998)

In sum, contemporary and future socio-economic and environmental challenges set an overarching context for higher education as a whole, not least, indicating the kind of aptitudes, understanding and competencies that may be needed by our graduates, both now and for an uncertain future. This is recognised by many students (Bone and Agombar 2011).

> *ESD is essential for the achievement of a sustainable society and is therefore desirable at all levels of formal education and training, as well as in non-formal and informal learning.*
> (Council of the European Union 2010)

Similarly, global challenges also raise questions about the adequacy of the kinds of attributes and skills with which graduates currently enter the social and employment worlds.

> **In a nutshell:**
>
> sustainability education prepares people to cope with, manage and shape social, economic and ecological conditions characterised by change, uncertainty, risk and complexity.

Further, with all universities now involved in carbon management plans, as well as seeking savings with resources, the need to go beyond technical measures and develop an aware and engaged staff/student community puts sustainability education, both formal and informal, at centre stage.

It is relevant to – and ideally takes place across – four domains: the personal; the professional, the organisational (HEI); and the social or community level.

ESD is flourishing in those universities where it is:

- embedded in the curriculum;
- part of the culture of the university;
- seen in relation to (rather than separate from) other agendas such as employability, internationalisation and enterprise;
- linked to sustainability initiatives and learning in the wider community.

1.4 What is sustainable development?

'Sustainable development' describes the processes and activities that help ensure social, economic and ecological wellbeing, at any focus – local, regional, global – where these three dimensions are seen as systemically interdependent and inseparable. By contrast, unsustainable development has a deleterious effect on at least one of these dimensions of wellbeing.

Sustainability is at the heart of the Earth Charter Initiative, an international declaration of fundamental ethical principles for building a just, sustainable and peaceful global society in the 21st century. Its mission is to:

> *... promote the transition to sustainable ways of living and a global society founded on a shared ethical framework that includes respect and care for the community of life, ecological integrity, universal human rights, respect for diversity, economic justice, democracy, and a culture of peace.*
> (See: http://www.earthcharterinaction.org/content/)

> *Most people in the world today have an immediate and intuitive sense of the urgent need to build a sustainable future. They may not be able to provide a precise definition of sustainability ... but they clearly sense the danger and the need for informed action.*
> (UNESCO 1997, p7)

Interest and activity in sustainable development is driven by rising concern in public life and wider society as people in all sectors become increasingly aware of the negative impact and threat of sustainability issues – such as climate change, economic vulnerability, social inequity, resource depletion and species loss in conditions of increasing global population – as well as of positive opportunities to develop more sustainable lifestyles and economic activities.

Key point: In essence, sustainability is about trying to ensure a society, economy and ecology that are viable now and long-term.

Evidence suggests we may be on the cusp of very different patterns of social and economic organisation, in response to the end of cheap energy and the threat of climate change - necessarily towards low carbon, low waste, resource efficient, and possibly more localised economies. Such changes are increasingly reflected in government and business rhetoric. There is growing awareness

that we need to rethink many past patterns of economic and social organisation if we are to assure the future (UN Economic and Social Council, 2011).

> *The European Union faces a considerable number of interlinked challenges in the early 21st century, including the economic and social consequences of the global financial crisis, climate change, declining water and energy resources, shrinking biodiversity, threats to food security and health risks.*
> (Council of the European Union 2010)

Whatever transpires, it is clear that our graduates are faced by very different conditions than those of a generation ago, and will need capabilities to cope with conditions of uncertainty, complexity and rapid change, as well as to contribute positively to a more sustainable, safe and secure future.

The role of universities in developing graduates who are 'global citizens' – that is, they better understand how the world works, their own responsibilities, and the sustainability or otherwise of many activities – is arguably one of the most significant and pressing issues for higher education in the 21st century. The rise to prominence of ESD in higher education in recent years marks a significant step towards fostering 'global citizens' who are central to building a safer and more sustainable future.

1.5 Three tricky words: why is it difficult to 'pin down' ESD?

Some academics find ESD frustrating. They have a sense it's important and relevant but 'what is it *exactly*?' It seems to be about everything, but without more specificity, it's hard to tie down, and this makes it difficult to approach and integrate into current programmes.

There are no clear or obvious content boundaries, holistic and interdisciplinary approaches are implied, ethical dimensions often arise, and the ground is shifting by the day – as is evidenced by the news, whether it's about energy, health, social justice, migration, environmental stresses, climate change, globalisation and so on.

Then there's the term itself: 'ESD', which is advocated by UNESCO and government as an educational response to these conditions. But the term ESD is made up of three tricky words, *education*, *sustainable* and *development*. All of which are big fields and contentious in their own right.

No wonder then, that ESD is big and slippery. But it is also rich in potential, relevance and opportunity. This Framework is designed to help make it approachable and practicable. But the first question is ...

2 Why bother?

This section sets out three categories of reasons that underline the importance of engaging with sustainability education:

- **The wider context and employment (2.1);**
- **Policy and mandate (2.2);**
- **Education and quality (2.3).**

Key point: ESD is a rising agenda in higher education both in the UK and internationally.

Yet there are large parts of HE policy and practice totally untouched by it – partly for perfectly valid reasons. So why should anybody bother?

Here are three categories of rationale for addressing ESD:

- **wider context and employment** – the need for HE to both respond to and help shape real-world conditions;
- **policy and mandate** – expectations from funding councils, and increasingly, from HEI senior managers;
- **education and quality** – quality and innovative teaching and learning.

2.1 The wider context and employment: heading for a different world

The economic and employment context

The debt crisis is hitting economies, while globalisation means that national economies cannot weather instability alone but each are affected, and all are intertwined. The twin issues of climate change and peak oil (see below) are predicted to exacerbate economic dislocation and instability.

In response to this 'different world' governments are realigning policy. The current UK coalition government is seeking to support a low carbon, eco-friendly economy resilient to climate change, according to DEFRA.

This raises the issue of employability and skills appropriate to an economy and society in a state of transition:

The transition to a low carbon world will transform our whole economy. It will change our industrial landscape, the supply chains of our businesses and the way we all live and work. The vast majority of, if not all, economic activity in Britain will have to reduce its carbon impact significantly.
(See: http://www.bis.gov.uk/policies/business-sectors/low-carbon-business-opportunities)

25,000 applicants to universities and colleges surveyed:
The survey paints a picture of a generation that is intensely aware of the big challenges facing the planet and eager to see broader social and political change …
(Forum for the Future/UCAS 2008, p1)

(Also see 'Skills for a Green Economy' at http://www.bis.gov.uk/policies/further-education-skills/skills-for-green-economy)

Research shows that increasingly, employers are seeking graduates with the skills to address sustainability issues and work in conditions of change and uncertainty. A report *Leadership Skills for a Sustainable Economy* commissioned by Business in the Community (BITC 2010) shows that over 90% of businesses already recognise these skills are a critical business issue, and 80% think there is an urgent need to put more programmes in place:

Developing the leadership skills we need for the transition to a sustainable economy is both urgent and critical to our future economic success – as well as to our social and environmental well-being.
(BITC 2010)

Similarly, a report by the Aldersgate Group, suggests that:

… an effective policy for skills and employment requires a much deeper understanding of the nature of the transition (to a low carbon economy) and of the skills that will be necessary to transform our economy.
(Aldersgate Group 2009)

At the same time, the professions are increasingly reflecting a sustainability dimension in their requirements.

This complements an HEA research report carried out by StudentForce, which found that:

- the trend towards 'more responsible employers' is affecting the graduate job market as well as the competencies expected from graduate recruits;
- the graduate employment agenda is becoming more closely linked to the employer sustainability agenda;
- there is growing evidence that students want to work for ethical employers who are environmentally and socially responsible.

(Cade 2008)

Research also shows that increasingly, students are keen to gain the skills necessary to effect sustainable change in their working lives. This is partly due to the desire to be employable, but also from the students' own sense of ethics. Some universities are now marketing themselves as 'green' (with regard to their campuses and/or their curriculum) in an effort to attract and retain these students.

A recent major research report, which attracted a response of nearly 6,000 students across the UK, shows that first-year students believe their university should be responsible for actively incorporating and promoting sustainable development to prepare their students for graduate employment (see box).

> *80% of respondents believe sustainability skills are going to be important to their future employers and the majority of first-year students involved believe that it is the role of universities and courses to prepare them for graduate employment. The softer skills incorporated within sustainable development are consistently of paramount importance to graduates, regardless of course, university type or UK nation.*
> (Bone and Agombar 2011)

Discussion Q: How far, in your view, are universities equipping students with green employment skills and competencies, and the ability to anticipate change?

Wider context

Key point: Contextual issues are the key driver for ESD.

The world is changing rapidly, and many indicators of human and environmental welfare are pointing in the 'wrong' direction as evidenced by numerous international and national reports. Contemporary socio-economic and ecological conditions at all scales from local to global seem characterised by fluidity, complexity, uncertainty, and indeed, unsustainability. At the same time, the world's population has risen from 2 billion in 1930 to 7 billion now, with 9 billion projected by 2050, auguring major environmental, economic and social stresses.

> *Through their roles as educators and researchers, institutions can contribute to securing a safer and more sustainable future against recognised threats such as climate change and global poverty. Our choices now will influence whether current and future generations will live with a changed climate, depleted resources and without the open space and biodiversity that contribute to our standard of living and quality of life.*
> (HEFCE 2009, p7)

This sets an overriding and pressing context for educational policy and practice as a whole in relation to HE's responsibility to society and our graduates.

The global economy is facing a 'triple crunch'. It is a combination of a credit-fuelled financial crisis, accelerating climate change and an encroaching peak in oil production. These three overlapping events threaten to develop into a perfect storm, with potential consequences not seen since the Great Depression.
(New Economics Foundation 2008)

The 'different world' our graduates are entering is characterised by what has been termed the 'triple crunch' of three interrelated major global trends: growing climate change, the end of cheap energy coinciding with diminishing or hard to access fossil fuel resources, and of economic instability. Moreover, such trends are systemically linked, so that key issues cannot be considered or addressed separately. These are huge and contentious issues that require multiple and interdisciplinary perspectives, innovation and enterprise to address – a challenge HE is uniquely placed to address.

University leavers, where most of tomorrow's leaders are being prepared, can expect over 60 years of healthy active life. Yet long before the end of that time, scientists predict possibly catastrophic rises in global temperature – unless, that is, we change our carbon-addicted ways.
(Parkin 2010, p1)

Climate change: Higher global mean temperatures are predicted and evidence suggests the trend is now underway. The ramifications of this include: more people living in high flood risk areas, more species under high risk of extinction, higher risk of major sea level rises that threaten many highly populated cities and regions around the world, an increase in global diseases, and increased droughts that threaten food supplies, and migration pressures.

We are addressing not just the future of humanity in an abstract sense, but the future of our families and our friends. No generation has faced a challenge with the complexity, scale, and urgency of the one that we face.
(Brown 2011, pxi)

Discussion Q: To what extent are students being equipped to adapt with these emerging conditions?

Peak oil: Various estimates suggest that yearly production of oil is likely to plateau by 2020 or earlier and then start to fall, due to limited supplies available in the earth. As this happens, the price of oil will rise, along with the prices of everything that relies on oil, such as: transport, medicine, plastics, and food. This is predicted to lead to economic instability.

Discussion Q: How far are students being prepared for, and equipped to handle, possibly very radically changed economic conditions and patterns? Are students sufficiently resilient and skilled to manage?

2.2 Policy and mandate

A second driver for ESD is supportive *policy and mandate*.

Key point: There is an increasingly strong mandate for ESD.

In the UK, universities and colleges are paying increased attention to ESD in response to the Government's vision for a low carbon economy, as reflected in the *Carbon reduction target and strategy for higher education in England* (2010). **Government and devolved administration policy** has supported ESD and this is further reflected in turn by the strategies and policies of the funding councils.

> *We are heading towards a global oil supply crunch and price spike.*
> Froggatt and Lahn, Chatham House, 2010

The **Higher Education Funding Council for England** (HEFCE) has a sustainable development strategic statement and action plan, which was updated in 2009 following a consultation with HE stakeholders. It suggests that higher education "can help to promote new and sustainable ways of living, working, producing and travelling that will help achieve wider benefits to human health and wellbeing" (2009, p7). Further, it states:

> *The greatest contribution HE can make to sustainable development is by enabling students to acquire the skills and knowledge that allow them to make a lasting difference. What they learn and what they are taught are therefore critical.*
> (HEFCE 2009, p15)

Further, the statement reiterates HEFCE's vision for the sector, first expressed in 2005:

> *Within the next 10 years, the higher education sector in this country will be recognised as a major contributor to society's efforts to achieve sustainability – through the skills and knowledge that its graduates learn and put into practice, its research and exchange of knowledge through business, community and public policy engagement, and through its own strategies and operations.*
> (HEFCE 2009, p3)

In Scotland, the **Scottish Government** has published an action plan reviewing progress during the UN Decade of ESD, and setting actions for the forthcoming years "to help ensure that education for sustainable development is truly embedded in all areas of education throughout Scotland" (Scottish Government 2010). In the section on HE and FE, the action plan envisages a Scotland where:

- Our universities and colleges play a key role in developing knowledge and understanding of sustainable development.

- Estates developments embody the principles of sustainable development and encourage learners and staff to act sustainably.
- Education for sustainable development is integrated into curricula.
- The whole experience offered to learners contributes to the development of their sustainability literacy and citizenship skills, attitudes and behaviours.
- Universities and colleges have access to the highest quality materials, advice and support to enable them to embed education for sustainable development into their courses and the wider student experience.
- The value of sustainability skills is understood and articulated by institutions, learners and employers.

Further, all Scottish HEIs and almost all of Scotland's colleges have signed up to the Universities and Colleges Climate Commitment for Scotland (UCCCfS; see: http://www.eauc.org.uk/ucccfs).

The **Welsh Government** has a 'Strategy for Action' for what is termed 'ESDGC' (education for sustainable development and global citizenship) across all phases of education. The section on HE notes:

> *The widest dissemination of an understanding of ESDGC will be vital if people are to be enthusiastic participants in the social transformations that will occur. Information will need to be available to all sectors of society – from those currently in positions of leadership to those taking their first steps in education.*
>
> *HE has a key role, since the students passing through it include a significant percentage of young society, of an age where questioning and forming views is critical, and of those who will be tomorrow's leaders. The method of teaching in HE encourages a critical, involved view, which will be vital in implementing ESDGC. Those integrative ways of thinking are implicit in ESDGC and can only enhance learning.*
> (Welsh Government 2008, p59)
> Education for Sustainable Development Action – Updates (January 2009)

Universities UK (UUK) published *A university leaders' statement of intent on sustainable development* in 2009, which says:

> *The global challenges faced today cannot be solved in isolation and to ensure a sustainable future the sector must share good practice and collaborate within and across institutions, work with staff and students, student unions and with external partners.*

Internationally, we are some three-quarters of the way through the **UN Decade of Education for Sustainable Development** (DESD 2005-2014). This seeks to "integrate the principles, values, and practices of sustainable development into all aspects of education and learning, in order to address the social, economic, cultural and environmental problems we face in the 21st century". Its primary goal is to: "encourage Governments to consider the inclusion … of measures to implement the Decade in their respective education systems … and national development plans" (United Nations General Assembly resolution 59/237), and UK governments and devolved

administrations have responded accordingly. See http://portal.unesco.org/geography/en/ev.php-URL_ID=14131&URL_DO=DO_TOPIC&URL_SECTION=201.html

> *In a continuously changing world, all European citizens should be equipped with the knowledge, skills and attitudes needed to understand and deal with the challenges and complexities of modern day life, whilst taking due account of the environmental, social, cultural and economic implications, as well as to assume their global responsibilities.*
> (Council of the European Union 2010)

2.3 Education and quality

The third area of rationale for ESD relates to its *implications for teaching and learning.*

Key point: ESD offers relevance and renewal in curriculum and pedagogy.

The work of the Higher Education Academy ESD Project has demonstrated that many academics find that curriculum initiatives built around sustainability themes and innovative pedagogies have led to renewed student interest, and often, work that transcends lecture room and disciplinary boundaries. Hence, there is strong potential link between interest in sustainability education and quality provision (see, for example, current work in this area at: http://insight.glos.ac.uk/sustainability/Education/hefcelgmquality/Pages/default.aspx).

A HEFCE 'strategic review' that researched the prevalence of teaching and learning related to sustainability in English HEIs in 2008 states:

> *… in general, good sustainable development pedagogy is often simply good pedagogy. Hence its promotion is broadly consistent with a commitment to improve quality in the sector.*
> (Policy Studies Institute *et al.* 2008, p34)

Further, a general conclusion of the review is that:

> *Potential synergies exist between the development and dissemination of pedagogies appropriate to sustainable development teaching in higher education and the enhancement of pedagogic quality across the sector more widely.*
> (2008, p35)

In a nutshell – drivers encouraging embedding of sustainability in higher education:

- rising public interest and global concern over sustainability-related issues;
- Government and funding council mandate and expectations including carbon management;
- links to employability and views of employers;
- profession's requirements;

- student demand;
- links made between corporate social responsibility and sustainability;
- financial savings made by better environmental practices;
- marketing and recruitment advantage;
- enrichment of curriculum and enhancement of teaching and learning;
- felt obligation by many academics to their students as next generation;
- corporate policy in the leading HEIs engaging with this agenda.

See also 'Embedding ESD in the HE curriculum – drivers and limiters' in the Appendices.

3 Graduates fit for the future?

This section looks at graduate skills and attributes in the light of the sustainability agenda.

The problems we now face at both a local and global scale puts higher education firmly in the driving seat to equip its learners with the knowledge, skills and understanding to pioneer innovative and creative responses to achieving wider economic, social and environmental well-being.
(Steuer and Marks 2008, p12)

A view from the New Economics Foundation
Seven things every graduate should know

1. *In-depth knowledge of a favourite subject – advanced knowledge and understanding.*

2. *How to apply knowledge – understanding how to make sense of and make use of the knowledge gained from higher education.*

3. *What makes a good life – knowledge about those factors that support human flourishing and happiness.*

4. *How others think – building students' capabilities to reflect on how their own ways of thinking are based on certain values which are affected by, and impact upon, others and the world around them.*

5. *How change happens – broader thinking about how change happens so that we can be more creative and adept at devising strategies to confront the enormous challenges facing our societies and planet.*

6. *The dynamics of power and influence – if learners are to be equipped to bring about change in their own lives, as well as in the lives of others, learning about power and influence must be a key feature of higher education.*

7. *Global interdependence – the development of a global perspective and an adoption of an approach to develop global citizens who understand the need for sustainable development should be vital for all higher education curricula irrespective of subject area.*

(Steuer and Marks 2008, p12)

Sustainability literacy and skills

By definition, all HE is a preparation for life, work and future learning. In the current climate of changing conditions and economic uncertainty, there is much debate on 'graduate attributes' around the question of what dispositions, understanding, competencies and skills might graduates best have when they leave university (Booth 2010; see also, the 'Employment' subsection above).

Given the 'why bother?' factors reviewed above, it is very important that sustainability is a *central* rather than marginal part of this debate. The perspectives and insights that ESD has to offer have developed under the collective umbrella of the term 'sustainability literacy' (although some academics do not favour the term).

The NGO Forum for the Future coined the term 'sustainability literacy' and defined it as follows:

> Expressed at the highest level, a sustainability literate person would be expected to: understand the need for change to a sustainable way of doing things, individually and collectively;
>
> *1. have sufficient knowledge and skills to decide and act in a way that favours sustainable development;*
>
> *2. be able to recognise and reward other people's decisions and actions that favour sustainable development.*
>
> (Parkin *et al.* 2004, p9)

Forum for the Future went on to distinguish three elements:

- professional *specialist* elements i.e. those elements that relate to specific professions whether construction, accountancy, nursing, etc.;
- professional *transferable* elements, i.e. skills and knowledge that were sufficiently generic to apply across professions;
- *personal* elements, e.g. interpersonal skills, critical evaluation, reflective learning.

In 2005, the HEA's 'Dawe Report' (Dawe *et al.* 2005) suggested and outlined a set of competencies that might define more closely the skills and dispositions conducive to building more sustainable development patterns in work and personal life. The 'sustainability literate graduate' would:

- be able to appreciate the importance of environmental, social and political contexts to their studies;
- be able to solve or ameliorate real life problems through employing holistic as well as reductionist approaches, as appropriate to the issue;
- be able to think creatively, holistically, and systemically and make critical judgements on issues;
- be able to develop a high level of self-reflection at a personal and professional level;
- be able to understand, critically evaluate and adopt thoughtfully sustainability values;

- be able to apply theory to practice and vice versa;
- be able to work collaboratively and work in interdisciplinary teams;
- be able to initiate and manage change that supports sustainable development in personal, institutional and social contexts develop and apply a broad and balanced knowledge of sustainable development.

This is broadly comparable with other interpretations, for example the German identification of 'Gestaltungskompetenz' (see box).

'Gestaltungskompetenz' – the German view of sustainability literacy

- Competence to think in a forward-looking manner, to deal with uncertainty and with predictions, expectations and plans for the future.
- Competence to work in an interdisciplinary manner.
- Competence to achieve open-minded perception, trans-cultural understanding and co-operation.
- Participatory competence.
- Planning and implementation competence.
- Ability to feel empathy, sympathy and solidarity.
- Competence to motivate oneself and others.
- Competence to reflect in a distanced manner on individual and cultural concepts

(Michelsen and Adomssent 2007, p22)

A successful UN Decade of ESD would create citizens and leaders who have skills in critical and creative thinking, conflict management, problem solving, problem assessment to actively take part in the life of society, are respectful of the Earth's resources and biodiversity, and are committed to promoting a peaceful and democratic society.
UNESCO, undated
http://www.unesco.org/en/esd/esd-e-module/a-worldwide-priority/how-to-implement-esd/

The University of Melbourne's model – of six 'new generation degrees' followed by a professional graduate degree or research degree – has won interest around the world. This 'Melbourne Experience' in relation to graduate attributes is largely consistent with the principles of ESD qualities and attributes. See Appendix 4 or http://www.qmul.ac.uk/docs/gacep/44631.pdf for details.

Key point: Such lists indicate that the emphasis in ESD is primarily on the student's attributes, dispositions and competencies rather than just a content-based approach around 'what has been learnt about sustainability'.

While there *is* a content element (see Section 7 'Key concepts and values' below) ultimately, the indicator of sound sustainability education is how far the student and graduate is able to contribute critically, positively and practically towards a more sustainable and liveable economy, community and society.

Given current socio-economic and environmental conditions of complexity and uncertainty, ideally, the sustainability learner will be characterised by such qualities as resilience, resourcefulness, creativity, systemic and critical thinking, enterprise, and a co-operative and caring outlook. This is consistent with the message from business, and the graduate attributes lists that many HEIs develop.

Using 'attributes' lists

At a practical level, you can use such lists as those above to:

- help determine which skills and competencies are relevant to your subject area;
- assess how far students already possess such skills, and which need to be developed, perhaps through personal development planning;
- decide which are important but outside the scope of the immediate programme or course as it currently stands (and therefore may need revision in future).

Discussion Q: What do you think are the essential aspects of sustainability literacy, and how far do they relate to the current view of dispositions, understanding and skills, reflected in your programmes and courses?

Some of these graduate attributes may be seen as 'higher level' competencies. This raises the question of appropriate pedagogies (see Section 8 'ESD pedagogies' below) that can cultivate such competencies.

4 Where to start?

This section offers advice both on starting ESD work (4.1) and taking it further (4.2).

Commencing ESD – or taking existing work further – very much depends on your starting point, in relation to your current knowledge and experience, those of your students, and your institutional context. Before using this section, you might want to first reflect on your/your HEI's current position in relation to ESD strengths, weaknesses, opportunities, etc. The questions outlined in Section 10 'Simple change tools' will help with this.

4.1 Getting going at individual or team level

These are some ideas that might help, if you are a lone academic, or small group, or team. This might seem a daunting list, but *any* of the following will help get the ball rolling, or help develop further momentum (see also Appendix 3 'Embedding ESD in the curriculum – tactics and ideas'):

- Get informed on ESD by using this guide and following up on the resources indicated. In particular, take a look at the support, resources and networks that national organisations can offer including the Higher Education Academy and the Environmental Association for Universities and Colleges (EAUC).
- Find allies – who you might work with or learn from, colleagues who are already engaged in ESD, perhaps in another school or faculty: begin to develop an ESD 'community of practice'.
- Check any institutional, school or faculty teaching and learning strategies for current or potential relevance to sustainability as regards content and pedagogy.
- Evaluate any university policies in relation to their current or potential relevance to sustainability.
- Assess the current state of ESD in the area of your work by doing a SWOT analysis with colleagues (strengths, weaknesses, opportunities, and threats).
- Begin an audit of modules and programmes you are involved in as regards sustainability content (see Appendix 6 'A basic ESD audit tool').
- Start by 'tweaking' and later further revising your programmes and courses to take account of sustainability (see Section 10.1 '4 Rs model').
- Consider and weigh the relative difficulty and advantages of revising existing modules to embed sustainability, or developing new sustainability-oriented modules.
- Design imaginative assessments that can encourage your students to consider sustainability topics in their coursework – minor adjustments at first, but consider building in sustainability-oriented assignments when programmes are revised.

- Start developing an action plan or strategy for yourself, or your group, or your school – depending on your position – which aims to embed ESD in curriculum effectively, within a stated time frame.
- Talk to your students' union: they may well be involved in sustainability initiatives that can relate to curriculum.
- Suggest sustainability themes and opportunities relevant to student projects and work placements.
- Talk to estates: they may well be involved in sustainability initiatives that can relate to curriculum.
- Build sustainability into your course monitoring and course approval procedures.
- Be opportunist and proactive.
- Do it yourself. That is, make a start, however small, rather than wait for policy to change.

4.2 When more established – the wider institution

- Organise events that have a sustainability theme to develop interest and networks, e.g. seminars, lectures, workshops, green weeks, community events, outside speakers, etc.
- With a network of interested people involved, and with the support of senior management if at all possible, work towards embedding sustainability in faculty and institutional teaching and learning policies.
- Make the business case for sustainability to colleagues and decision-makers. This can include increased staff/student motivation, research opportunities, knowledge transfer, profile and student recruitment.
- With a network of interested people involved, and with the support of senior management if at all possible, work towards the development of a sustainability policy for the institution.
- Establish a network of involved and interested colleagues – perhaps involving teaching, research and support staff. Some HEIs have a network of ESD champions or contact points across schools.
- Ask for or help initiate development staff development programmes with an ESD theme.
- Ensure you do 'what it says on the tin': if your programme is marketed as having a sustainability dimension, it needs to reflect it: students are quick to pick up on gaps.
- Publicise and share successes both internally and externally.

Discussion Q: Which of these tactics might work for you – or perhaps is already working? What other ideas for taking this work forward might you or your colleagues have?

5 Barriers and pathways

This section looks at common hurdles to embedding ESD and offers some possible pathways through.

Whereas there are many examples of successful implementation of ESD programmes and initiatives, research and experience indicates a number of hurdles to the embedding of ESD that are often common to HEIs. You may well recognise some of them!

Research for HEFCE (Policy Studies Institute *et al.* 2008, pvii) concluded that barriers, where they exist, essentially amount to:

- lack of interest in sustainable development (SD);
- silo or mono-disciplinary thinking and institutional organisation, which militate against the cross-departmental activity that is essential for sustainable development;
- lack of incentives or priority to engage in SD.

Similarly, the Higher Education Academy's 'Dawe Report' (Dawe *et al.* 2005) – based on a research exercise working with HEA subject centres in 2005 – suggested several factors prevent academics from engaging with SD in the curriculum. We've added some 'typical' comments that sceptical or just hard-pressed academics tend to make:

- crowded curriculum – '*There's no space for more material*';
- perceived irrelevance – *'It's not relevant to my subject'*;
- limited staff awareness and/or expertise – *'I'm interested and think it's important but I don't feel I know enough to handle this area'*;
- limited institutional commitment – *'We can't do much as senior management aren't at all supportive'*;
- limited commitment from external stakeholders – '*There's no demand from employers or professional bodies'*;
- seen as too demanding – *'It sounds too difficult, particularly if it's asking me to engage with new pedagogy or attempt interdisciplinary approaches'*.

See also Appendix 2 'Embedding ESD in the HE curriculum – drivers and limiters'.

These might be characterised into a typology of *kinds* of limiting factors:

- paradigmatic/perceptual;
- policy/purpose-related;
- structural (governance, compartmentalisation, budgetary etc.);
- resource/information deficiency.

Discussion Q: Which apply to your HEI? And how far? Are there additional factors operative at your HEI?

Such 'barrier lists' might be revisited as follows to indicate possible ways forward or pathways:

Barrier	Possible pathway
Crowded curriculum	ESD does not necessarily mean adding significant new content: often it is a matter of modification of existing content. Begin with an audit to see what is already present, or what can be built upon.
Perceived irrelevance	While ESD is more 'obviously relevant' to some subjects than others, virtually all can both relate and benefit in some way. See Section 9 'ESD in the disciplines', and check 'Resources' for help with your subject area.
Limited staff awareness or expertise	Professional development, linking up with experienced colleagues and plugging into ESD networks (see 'Resources') can help. But it's not necessary to be an expert to begin or explore possibilities.
Limited institutional commitment	Look at your existing HEI agendas – there are often sustainability dimensions that can be explored. Work longer term to build alliances, interest and commitment. Develop a business case for ESD.
Limited commitment from external stakeholders	Check: local and regional policies for sustainability objectives; research on employers' views; check professional bodies regarding policy intentions.

Lack of incentives	Create your own where necessary: e.g. link funding bids to sustainability criteria; help orient existing staff rewards in teaching and learning towards sustainability criteria.
'Silo' organisation	Start making horizontal links – cross-school, cross-faculty, cross-institutional: any sustainability scheme, for example, around campus change or community engagement can act as a platform for such links. Initiate schemes, joint seminars, modules, etc. that facilitate cross-disciplinary working.
Too demanding	Learn from others in your institution or beyond who have made a step towards sustainability – see what benefits have ensued, and start small yourself.
Lack of resources	See what existing resources can be reoriented; look out for opportunities to make bids based on a sustainability theme, internally and externally.

Discussion Q: How relevant are these barriers to your situation? Are there others that apply? How useful are the 'possible pathways'? These kinds of ideas can be used in staff development to stimulate debate and dialogue.

6 Objections and answers

This section looks at commonly heard objections to embedding ESD and offers some answers.

In addition to barriers that obstruct or limit progress towards sustainability, some academics have outright objections to sustainability. You may share, quite understandably, aspects of these – or have colleagues who do – so it's important to consider and address them. Again, we've added some 'typical' comments that sceptical or hard-pressed academics might make, based on experience.

Objections:

1. Academic freedom – *'Being expected to integrate sustainability into my teaching interferes with academic freedom.'*
2. Ideology – '*Promoting sustainability is promoting an ideology and that is not the job of higher education.'*
3. Floodgates – *'If sustainability, why not a whole raft of other areas – where's it going to stop?'*
4. Apathy – *'If students aren't interested, it's not my job to sell sustainability.'*
5. Rapid change – '*There's enough change happening in the sector – now isn't a good time to take on any more!'*

Let's look at possible answers to these points.

Objection	Possible answer
Academic freedom	It is perhaps debatable just how free universities and individual academics are given Government, funding council and internal policies, and tied funding sources, but this point aside, most academics have considerable choice over if, how and where to embed sustainability, even if it is part of their university's policy.

Ideology	Most academics would agree that it is the job of HE to promote critical inquiry and reflection. This particularly applies to sustainability issues, which are often contentious and complex. That said, there are a broad range of ideological positions associated with sustainability/unsustainability debates and HE is well placed to bring a critical lens to the discourses associated with this field of inquiry.
Floodgates	This view tends to see sustainability as a separate and contained area competing for attention, whereas it is more accurately seen as a dimension, backdrop, approach or context that can inform and enrich most areas of curriculum concern.
Apathy	It's not HE's job to 'sell' anything, but arguably, it's HE's responsibility to anticipate and prepare graduates for the world they will inherit and give them competencies to cope with and shape the social, economic, environmental and political pressures and influences they will undoubtedly encounter.
Rapid change	Sustainability issues – including the sustainability of any particular institution itself – are very much part of the shifting agenda that HE now faces. With policy advancing towards the low carbon economy and the need for green skills, universities need to get ahead of the game.

Discussion Q: How valid are these objections? Are there others that apply to your situation? How valid are the 'possible answers'? These kinds of ideas can be used in staff development to stimulate debate and dialogue.

7 Key concepts and values

This section outlines some ideas on sustainability concepts (7.1) and also looks at values (7.2) associated with sustainability. (For skills look at Section 3.)

> *It remains our view that the greatest contribution that universities and colleges can make to sustainable development is through the* values, skills *and* knowledge *that students learn and put into practice.* (HEFCE 2009, p21)

7.1 Concepts

Assuming you want to embed sustainability in your curriculum: what does this involve in relation to content? Existing content in your programme may be fine as it is, or just need a little tweaking or modification, or perhaps more thorough integration of concepts is appropriate (see Section 10.1 '4 Rs model' below).

Key point: Sustainability education suggests no definitive list, rather concepts and ideas that may be more or less relevant to your own situation and disciplinary area, and which you might want to use/adapt/extend as entry points to sustainability education content.

Before looking at these, it's worth making some points about dimensions and placing of content:

Dimensions

ESD puts emphasis on the necessary interrelationships between:

- **Theory and practice:** so a curriculum that only focuses on a theoretical level without considering practice and application is likely to be incomplete.
- **Local and global scales:** so a curriculum that ignores spatial connections between global and local levels may be incomplete.
- **Present and future**: so a curriculum that does not explore the links between present and likely future factors and trends may be incomplete.

Placing

- **Generic/specific**: it's useful to distinguish between *generic* concepts that apply across subject areas, and *subject-specific* concepts that are more specialist.

- **Contributory part**: sustainability-related content in the curriculum should be seen as a contributory part of a broader pedagogical process that encourages the sustainability literate and competent graduate to develop.

- **Reorientation:** essentially sustainability is more about reorienting existing curriculum aims and content than adding a whole lot more new material. That said, there is often a need to include at least some new ideas and concepts in existing curricula if they are to address sustainability adequately.

Clearly, if sustainability relates to nearly everything one way or another, the potential concept list is endless. Therefore, it's important to consider schemas that attempt to present key ideas, and elaborate from there according to your own circumstances and disciplinary area, drawing on the significant resources available (see 'Resources').

One such schema – which has been influential in and beyond the schools sector and been adapted and extended in various ways – was first developed by the Government's Sustainable Development Education Panel (1998).

Seven key concepts of sustainable development

- Interdependence – of society, economy, and the natural environment, from local to global scales.
- Citizenship and stewardship – rights and responsibilities, participation and co-operation.
- Needs and rights – of future generations.
- Diversity – the importance of cultural, social, economic and biological variety.
- Quality of life, equity and justice.
- Sustainable change – development and carrying capacity.
- Uncertainty and precaution in action.

At school level, these principles were translated into much more specific and detailed concepts and learning outcomes according to age and subject.

Five capitals model

Another schema to describe sustainability is the 'Five capitals model' developed by Forum for the Future, which suggests that "we are facing a sustainability crisis because we're consuming our stocks of natural, human and social capital faster than they are being produced".

Natural capital is any stock or flow of energy and material that produces goods and services. It includes:

- resources – renewable and non-renewable materials;
- sinks – that absorb, neutralise or recycle wastes;
- processes – such as climate regulation.

Natural capital is the basis not only of production but of life itself!

Human capital consists of people's health, knowledge, skills and motivation. All these things are needed for productive work.

Enhancing human capital through education and training is central to a flourishing economy.

Social capital concerns the institutions that help us maintain and develop human capital in partnership with others, e.g. families, communities, businesses, trade unions, schools and voluntary organisations.

Manufactured capital comprises material goods or fixed assets that contribute to the production process rather than being the output itself – e.g. tools, machines and buildings.

Financial capital plays an important role in our economy, enabling the other types of capital to be owned and traded. Unlike the other types, it has no real value itself but is representative of natural, human, social or manufactured capital, e.g. shares, bonds or banknotes.

> *In 2007, humanity's footprint exceeded the Earth's biocapacity by 50%. Put another way, people used the equivalent of 1.5 planets to support their activities.*
> (WWF 2010)

For more details see:
http://www.forumforthefuture.org/sites/default/files/project/downloads/five-capitals-model.pdf

Other models include:

The ten principles of One Planet Living.
This was developed by BioRegional and WWF.

The principles are: zero carbon; zero waste; sustainable transport; sustainable materials; local, sustainable food; sustainable water; natural habitats; culture and heritage; equity and fair trade; and health and happiness.

For more details see: http://www.oneplanetliving.org/index.html

SustNav

This framework was developed by Sustainability South West as a decision-making tool particularly at local level. The principles are: developing sustainability skills; improving health and wellbeing; reducing inequalities; cutting resource use; supporting low carbon economies; reducing high carbon travel; living locally; reviving life-support systems; being inclusive; and thinking long-term.
For more details see: http://www.SustNav.org.uk

A more detailed list of important sustainability concepts is shown in Appendix 5 'Indicative list of sustainability concepts'. This is neither exhaustive nor necessarily appropriate to your subject area but should be regarded as indicating the kind of territory that sustainability issues cover.

Discussion Q: How far are sustainability concepts addressed in your programme?

Discussion Q: What sustainability concepts are specific to your disciplinary area?

> *If values were explicitly incorporated in the curriculum, they could be accused of imposing ideologies on learners. But if all mention of values is expunged from education, then this leaves little choice but for learners to draw their values from the unsustainable society around them, or from the values latent in the 'hidden curriculum' of their educational institution.*
> (Newman 2010)

7.2 Values

It is often stated that society needs new values, to counter excessive consumerism, individualism, inequity and materialism and help a more peaceable, equitable and sustainable culture to emerge.

Higher education tends to skirt around issues of values, preferring the language of quality assurance and skills to that of ethics and purpose. However, all university corporate plans present a set of values, as do teaching and learning strategies, often expressed in general terms.

In sustainability discourse and practice, a number of key values have emerged and some of these are reflected below. Exploration of any of these in a classroom situation will often involve relating them to a real-world situation and to students' own interests and values:

- sufficiency (living lightly);
- equity and justice (intragenerational and intergenerational);
- social inclusion and meeting basic human needs;
- participation and empowerment;
- eco-efficiency (in resource use);
- biodiversity and green space;
- human rights and needs;
- ethical investment and fair trade;

- sustainable consumerism;
- animal and biocentric rights and needs;
- democracy and participation;
- resource conservation and efficiency;
- community and mutuality;
- meeting needs locally;
- resilience and durability;
- system health and well-being;
- futurity (taking the future into account today).

(For discussion of skills, see Section 3 'Graduates fit for the future?' above).

Discussion Q: How far are sustainability values addressed in your programme? Are there other values, perhaps specific to your subject area, which reflect sustainability values in some way?

8 ESD pedagogies

This section outlines the kinds of teaching method that sustainability implies (8.1); some approaches associated with sustainability education (8.2); and suggests some ideas for student assessments (8.3).

8.1 Challenges and shifts

In the field of ESD, there is a broad consensus that sustainability education requires active, participative and experiential learning methods that engage the learner and make a real difference to the learner's understanding, thinking and ability to act.

> *ESD should emphasise creative thinking, innovation and the long-term perspective, particularly our responsibility towards future generations.*
> (Council of the European Union 2010)

The kind of assumptions that underlie thinking and practice in ESD are that:

- individuals, organisations and society need to shift values, thinking, policies and practices towards those that can help ensure a viable future;
- sustainability issues are often characterised by complexity and uncertainty and cannot be understood adequately through single disciplines, although each has a contribution to make;
- sustainability issues often present ethical challenges and dilemmas;
- sustainability issues are often marked by rapid change as evidenced by news coverage of such topics as energy, health, social justice, migration, environmental stresses, climate change, globalisation, etc.;
- sustainability requires learning that engages and develops the 'whole person': affective, cognitive and practical dimensions and abilities, and in relation to 'real-world' issues and concerns.

Sustainability and sustainable development concern ideas, understanding, values and skills that are highly relevant to today's society, economy, our environment and our individual and collective futures. We live in conditions of unsustainability, complexity, interdependence and uncertainty.

And so teaching with sustainability in mind is a challenge: as stated in the Introduction, there are no clear content boundaries, holistic and interdisciplinary approaches are implied, ethical dimensions often arise, and the ground is shifting by the day – as is evidenced by the news media touching on a whole range of issues relating to sustainability.

These assumptions and characteristics mean that – within the limits of course requirements – learning methods and approaches need to be more open-ended, participative, diverse and interactive than is often the case in academic teaching.

The student learning experience is key: in essence, it is about the full engagement of the learners, including affective, cognitive and active dimensions.

However, this significant challenge can also be regarded as an opportunity for innovation and development in teaching and learning. The kind of shifts in teaching and learning implied by ESD can be summed up by the table below, which is based on the experience of the EU Socrates Thematic Network for Agriculture, Forestry, Aquaculture and the Environment (AFANet), which between 1997 and 2000 explored in some detail the implications of a shift from transmissive methodology *towards* more participative and transformative methodology.

These kinds of shifts can be seen as consistent with current wider moves in higher education towards student-centred, diverse and active learning approaches.

Integration of sustainability within higher education implies shifts	
From	**Towards**
Transmissive learning	Learning through discovery
Teacher-centred approach	Learner-centred approach
Individual learning	Collaborative learning
Learning dominated by theory	Praxis-oriented learning linking theory and experience
Focus on accumulating knowledge and a content orientation	Focus on self-regulative learning and a 'real issues' orientation
Emphasis on cognitive objectives	Cognitive, affective and skills-related objectives
Institutional, staff-based teaching/learning	Learning with staff but also with and from outsiders

Source: Sterling (2004, p.58); adapted from Van den Bor *et al.* (2000).

8.2 Sustainability pedagogies

Expanding on the 'right-hand' characteristics shown in the above table, below are some further ideas to indicate the sorts of methodological approaches and values that are often associated with learning and teaching in relation to sustainability. Some readers will be familiar with these, others less so. Taking ESD further is often a matter of taking one, two or more of the less familiar approaches on board:

- critical thinking;
- systemic thinking;
- interdisciplinarity and transdisciplinarity;
- experiential learning and real-life issues;
- reconnecting to sense of place and real-world inquiry;
- empowerment of the learner;
- teacher as mentor, exemplar and facilitator;
- multiple teaching styles;
- developing dialogue;
- space for emergence;
- learning for action;
- reflection on learning (reflexivity);
- transformative learning;
- collaborative learning and co-inquiry;
- action competence;
- campus as curriculum and use of campus as a learning resource.

(Sterling 2008)

Such methodological values and approaches can be manifested through a number of methods, as suggested below. As noted above, some readers will be familiar with these, others less so. Taking ESD further is often a matter of extending pedagogic diversity by taking one, two or more of the less familiar methods on board:

- role plays and simulations;
- group discussions and dialogue;
- stimulus activities (e.g. use of photos, videos, newspapers);
- debates;
- diarying;
- critical incidents (posing critical events and asking what students would do);
- case studies;
- reflexive accounts;
- personal development planning (PDP);
- critical reading and writing;
- problem-based learning;
- fieldwork;
- modelling good practice;
- futures visioning;
- worldview and values research;
- action research.

(Adapted from Cotton and Winter (2010); see also Section 11 'Teaching/CPD Activities' below.)

8.3 Assessment

One way of introducing sustainability education is to adapt existing assessment assignments or introduce new assignments that relate to sustainability topics or issues, as long, of course, as they comply with the current programme learning outcomes.

The following is taken from Plymouth University's *Sowing Seeds* guide (Sterling 2008):

Some possible assignments are listed below; they may be used to supplement or adapt existing module assignments or could stand alone if a programme is revised.

Sustainable design and/or 'problem-solving': *students will be expected to use sustainability principles to rethink and redesign some aspect(s) of their personal, student or professional lives, or as a member of a community. This will involve recognising a range of different constraints and opportunities, supportive of more sustainable actions or behaviours. Write a paper describing and critically evaluating the experience and its potential.*

Communication and awareness raising: *groups of students are asked to research and design a communication initiative which raises awareness of sustainability issues on campus or in the local community. This might be through a website design, a poster campaign, a newsletter etc.*

Strategy development: *students are asked to develop a strategic framework for a particular group, institution, organisation, or network to promote change towards greater sustainability – based on a thorough assessment of the existing situation in terms of constraints and opportunities. Include a critical rationale, aims, implementation plan, evaluation methods, and indicators of change.*

Research on issues: *students research a specific sustainability issue relating to everyday behaviour at local, national or global scale – or linking these scales – with regard to its origins, its nature, differing views on prospects, directions and possible solutions.*

Discourse: *research and write a realistic and fair dialogical conversation reflecting opposing views around a sustainability issue. Possibilities could be: a technocratic and deep green advocate; or a pro-economic growth and no-growth stance ('limits to growth'); an advocate of globalisation vs. a supporter of localism; a GMO supporter vs. an organic grower. Conclude with your own critically reflective view.*

9 ESD in the disciplines

This section looks briefly at contributions that different subject areas can make to sustainability education (9.1) and the recent work of Higher Education Academy subject centres including some useful resources and websites (9.2) in specific subject areas.

9.1 The contribution of disciplines and subject areas

Virtually all disciplines and subject areas can make some contribution to ESD, and/or benefit from introducing an ESD element or dimension. A first step is to consider how your area can contribute or benefit, perhaps drawing from the many examples now available.

Beyond this, the multidimensional nature of many sustainability issues invites, and at times requires a corresponding multi- and interdisciplinary approach to inquiry and learning, setting a challenge for HE that traditionally remains primarily structured around disciplinary and compartmentalised structures. This may mean finding practitioners in other disciplines and subject areas who are engaged in, or willing to engage in, this challenge, either by introducing more multidisciplinary approaches in collaboration with other disciplines, or by attempting more fully engaged forms of interdisciplinarity.

This section introduces some very brief ideas that be developed under some subject areas.

For more detail, case studies and discussion see Resources including the US-based Disciplinary Associations Network for Sustainability.

Science

Possible approaches:
- learning how a product affects the environment in its entire life cycle;
- the science of climate change;
- ecology and conservation;
- energy futures;
- working with manufacturers in the chemistry industry to develop a relevant Masters degree.

Example:
Masters in Green Chemistry & Sustainable Industrial Technology at the University of York
See: http://www.york.ac.uk/res/gcg/education/msc/index.html

Law

Possible approaches:
- understanding the relationships between law, values, morals and national/international obligations;
- the emergence of environmental law;
- offering one module on Environmental Regulation and another, more theoretical module, on Environmental Justice.

Examples:
Masters of Environmental Law at the University of Dundee
See: http://www.ukcle.ac.uk/resources/esd/ross.html
Environmental Law case study at Plymouth University
See: http://www.ukcle.ac.uk/resources/sustainability/cases/

Economics

Possible approaches:
- ethics and behaviours as they relate to economic policy and impacts on society and environment;
- the economics of climate change;
- use of microeconomic tools to analyse environmental problems from both a local and a national perspective;
- offering an ecological economics course to students who have had an environmental economics course.

Example:
Ecological Economics course for Year 3 students at Keele University
See: http://www.ecoeco.org/content/2010/03/keele-university/

English

Possible approaches:
- introducing discourse analysis to students through texts such as advertisements;
- having students critically appraise nature writing.

Example:
Language & Ecology course at the University of Gloucestershire
See: http://www.english.heacademy.ac.uk/explore/publications/newsletters/newsissue14/stibbe.htm

Plymouth University research findings suggest that ... there is no obvious correlation between subject area and the belief of staff that sustainability is relevant to their discipline. It seems that tutors who are personally committed to sustainability are likely to see it as relevant to their teaching irrespective of what discipline they work in.
(Cotton and Winter 2010)

Planning

Possible approaches:
- understanding of international, national and local government policies and strategy on issues of the natural environment as it relates to the built environment, i.e. energy policy and regulations and initiatives such as the European carbon trading scheme.

Example:
Focusing thesis research of six students on identifying initiatives that will help deliver sustainable forms of regeneration for a failing Irish market town, Clones, in Co. Monaghan (Masters of Science in Planning at Queen's University Belfast:
See: http://www.heacademy.ac.uk/ourwork/teachingandlearning/alldisplay?type=projects&newid=esd/esd_group_enquiry_masters&site=york

Design

Possible approaches:
- understanding the role of the media in shaping society's ideas and concerns about the environment and sustainability;
- low energy and green design;
- principles of ecodesign.

Example:
Having students use a specially designed portal site to collate, evaluate and archive the sustainability-themed sites.
See University College Falmouth:
http://www.heacademy.ac.uk/ourwork/teachingandlearning/alldisplay?type=projects&newid=esd/esdecoloqo&site=york

Geography and Environmental Sciences

Possible approaches:
- exploring the human-environment relationship;
- exploring future patterns of food production, trade, energy, etc.

Example:
Embedding SD in the undergraduate Geography and Environmental Sciences curricula at the University of Brighton through structured and supported opportunities for experiential learning:
http://www.heacademy.ac.uk/ourwork/teachingandlearning/alldisplay?type=projects&newid=esd/esd_geo_environsci&site=york

History

Possible approaches:
- What is the historical causation for climate change? How should we seek to describe and analyse it?

- Does current knowledge of environmental change mean that we ought to be writing about the past differently from the way we have been doing so to date? How does this knowledge change our understanding of the 'philosophy of history' and hence our teaching and studying of it?
- Is the study of history of any practical use given the scale of the challenge before us?

Example:
'Past Actions, Present Woes, Future Potential: Rethinking History in the Light of Anthropogenic Climate Change' – a model syllabus for historians and other students of the past to engage with issues of anthropogenic climate change through the medium of history and related disciplines
http://www.historysubjectcentre.ac.uk/elibrary/internal/co_levene_pastactions_20100731/

Religious and Cultural Studies

Possible approaches:
- discussing ethics and different philosophical stances to provide students with an opportunity for reflective inquiry into areas such as animal rights, the place of humans and animals within ecosystems, the intrinsic worth of nature, the importance of future generations, and social justice;
- the nature of 'nature' in a technological world;
- inequity and environmental justice.

Example:
Using an electronic resource bank to enable increased awareness among undergraduates of sustainable development issues in a remote, environmentally sensitive region
See University of Stirling report:
http://www.heacademy.ac.uk/assets/documents/sustainability/esd_adderley_final.pdf

Business Studies, Environmental Studies, Hospitality, Leisure, Sports, Tourism, Sociology, Anthropology, Politics, Geography, Earth Sciences, Environmental Sciences

Possible approaches:
- understanding the drive for corporate social responsibility;
- the role of the corporation in defining societal norm and behaviours/practices;
- using products from around the world to teach sustainability principles;
- green travel and 'ecotourism'.

Example:
The 'Market Place', Sheffield Hallam University
http://www.heacademy.ac.uk/ourwork/teachingandlearning/alldisplay?type=projects&newid=esd/esd_marketplace&site=york

Construction and Civil Engineering

Possible approaches:
- understanding of the interaction between the built environment and natural environments especially as it relates to the use of energy resources in both the present and future contexts;

- looking at coastal defences and flooding;
- using e-learning materials to equip learners with essential knowledge and skills in the assessment of sustainability within the built environment, through the creation of a wiki.

Example:
Developing e-learning materials for sustainable construction management project at the University of Dundee
See: http://www.heacademy.ac.uk/ourwork/teachingandlearning/alldisplay?type=projects&newid=esd/esd_construction&site=york

Archaeology

Possible approaches:
- how cultural heritage can create communities of cohesion and belonging;
- using a web-delivered computer game that allows students to explore the relationship between environmental factors and human decision making for an early farm in the harsh environments of Iceland.

Example:
University of Bradford project:
http://www.heacademy.ac.uk/ourwork/teachingandlearning/alldisplay?type=projects&newid=esd/esd_elearn_archaeology&site=york

9.2 The Higher Education Academy's discipline-specific work on ESD

This section describes some of the recent discipline-specific work undertaken by the HEA relating to ESD. The HEA has done a significant amount of work in this area over the years, some of which is outlined below. For more information, please visit the subject centre website of interest. Note that at the time of writing all subject centre resources, including those pertinent to ESD, are in the process of being transferred to the HEA's main website.

Art Design Media:

- sustainability in broadcast journalism;
- a web portal for sustainable design teaching;
- entrepreneurship in economically deprived areas;
- a toolkit for sustainable fashion design.

See: http://www.adm.heacademy.ac.uk/projects/adm-hea-projects/adm-hea-learning-teaching-projects-2010-11

Bioscience:

- the nature and method of teaching, and the implementation of, sustainability integrated into the delivery and subject of teaching: guidelines for teaching staff;
- series of sheets on 'How to make your teaching more sustainable', including one sheet focused on teaching sustainability. In Pharmacology, for example, this might explore the metabolic end products of drugs and their impact on the environment;
- event resources from 'Teaching ethics to bioscience students: sustainability and the environment' at Cardiff University;
- a Bioethics briefing on crop plant genetic modification and a curriculum audit focusing on ethics and sustainability designed to facilitate ethics and ESD provision within a course.

See: http://www.bioscience.heacademy.ac.uk/resources/esd/

Built Environment:

- 'Designs on the Planet', an event that looked at how architectural education might respond to issues related to climate change;
- a Special Interest Group looking at integrating sustainable development into the Built Environment curricula, including the design of modules, case study production and consideration of the role of professional bodies.

See: http://cebe.cf.ac.uk/learning/sustainability/index.php

Business Management Accountancy and Finance (BMAF):

- a series of resources and events to facilitate the appropriate teaching and learning of ethical and sustainable management
  See: http://www.heacademy.ac.uk/business/publications/abstracts
- ethics guide produced with the Association of Business Schools
  See: http://www.heacademy.ac.uk/business/resources/a-z/ethics
- Enhancing Graduate Impact, a book in a series co-produced with the HLST subject centre, highlights examples of global and multicultural awareness, social awareness, integrity and ethical behaviour, and emotional intelligence
  See: http://www.heacademy.ac.uk/business/publications/Enhancing_series

Classics and Archaeology:

- a sustainability guide for archaeologists;
- a sustainability network for the humanities.

See: http://www.heacademy.ac.uk/hca/themes/sustainability

Dance, Drama and Music (PALATINE):

- chapter on ESD in HE dance, drama and music in *Sustainability Education: Perspectives and Practice across Higher Education* (published June 2010). The chapter describes and illustrates the manner in which performing arts institutions and courses have responded – frequently in innovative and imaginative ways – to the complexities and challenges of the ESD agenda.

See: http://www.palatine.ac.uk/resources/esd/

Economics:

- a case study on Ecological Economics, providing an overview of recent work done on problem-based learning (PBL) and Ecological Economics: 1) work done independently by an Economics graduate, and 2) a module taught at Keele University. Both elements of work used Joshua Farley's *Ecological Economics: a workbook for problem-based learning*.

See: http://www.economicsnetwork.ac.uk/showcase/witham_ecological

Education:

- website supporting teaching education for sustainable development and global citizenship (http://esdgc.escalate.ac.uk/) with news, further reading and resources;
- Open Sustainability in Education Resource (OSIER) repository (http://osier.ac.uk). This has been set up to share resources for the teaching of education for sustainable development and global citizenship;
- 'Promoting Education for Sustainable Development in Schools and Colleges through HE Action';
- 'COASTAL: (curriculum, outcomes, and sustainable teaching, assessment, learning) Sustainable Development in HE' identifies, shares and encourages the uptake of successful strategies for embedding sustainable development into the HE curriculum, addressing pedagogies and other learning and teaching practices (see: http://staffcentral.brighton.ac.uk/clt/ESD/about.html).

See: http://www.escalate.ac.uk and also: http://esdgc.escalate.ac.uk/

Engineering:

- development of resources with MIT (see: http://www-g.eng.cam.ac.uk/impee/);
- Interdisciplinary Special Interest Group (Ecohouse) at Sheffield Hallam University;
- chapter in Earthscan book, *Sustainability Education: Perspectives and Practice Across Higher Education*, published June 2010 (see: http://www.earthscan.co.uk/Portals/0/pdfs/Sustainability_Education.pdf);
- teaching guide (see: http://www.engsc.ac.uk/guides/introduction-to-sustainable-development);
- Developing a Global Dimension for Engineering in globalisation with DFID, See: http://www.engsc.ac.uk/global-dimension

See: http://www.engsc.ac.uk/sustainable-development

English:

- study of the scope and nature of teaching related to the environment, ecology and sustainability on English Literature, Language and Creative Writing degree programmes;
- audit of the relations between English and ESD: reviewing current practice in ESD in the discipline, considering how the discipline relates to the SD agenda and the related skills and attitudes acquired by our graduates;
- chapter in Earthscan book, *Sustainability Education: Perspectives and Practice Across Higher Education*, published June 2010.

See: http://www.english.heacademy.ac.uk/explore/resources/sustain/index.php

Geography, Earth and Environmental Science (GEES):

- *Pedagogy of Climate Change* (see: http://www.gees.ac.uk/pubs/other/pocc/pocc.htm);
- 'C-change in GEES: Open Licensing of Climate Change and Sustainability Resources in the Geography, Earth and Environmental Sciences' project (See: http://www.gees.ac.uk/funding/oerpilot.htm).

See: http://www.gees.ac.uk/projtheme/esd/esd.htm

Health Sciences and Practice:

- collaborating with the Healthy Universities Network in the development of the Healthy and Sustainable University.

See: http://www.healthyuniversities.ac.uk/

History:

- briefing report;
- course materials: 'Face of Humanity' and 'Past Actions, Present Woes, Future Potential: Rethinking History in the Light of Anthropogenic Climate Change';
- *Research Guide on Essay and Report Writing: A Guide to Students of Environmental History*;
- case study: 'Bringing the Outside In';
- podcast: 'Exploring Environmental History'.

See: http://www.historysubjectcentre.ac.uk/about/themebrowser/ESD

Hospitality, Leisure, Sport and Tourism (HLST):

- Olympics Special Interest Group (SIG), where urban renewal and sustainability are strong themes, and which published a case study, *How Green Are the Games?* (see: http://www.heacademy.ac.uk/learninglegacies/resources);
- fifteen sustainable development case studies (see: http://www.heacademy.ac.uk/hlst/resources/casestudies/sustainabledev);
- resource guides on ethics (see: http://www.heacademy.ac.uk/hlst/resources/a-zdirectory/ethics);
- *Enhancing Graduate Impact*, produced together with BMAF, highlights examples of global and multicultural awareness, social awareness, integrity and ethical behaviour, and emotional intelligence (see: http://www.heacademy.ac.uk/assets/hlst/documents/LINK_Newsletter/LinkNewsletter27.pdf).

See: http://www.heacademy.ac.uk/hlst/resources/a-zdirectory/education_for_sustainable_development

Information and Computer Sciences:

- TASC-ESD: Volunteer Transition to Academic and Social Confidence through an ESD Volunteering Activity.

See: http://www.ics.heacademy.ac.uk/projects/development-fund/fund_details.php?id=130

Languages, Linguistics and Area Studies (LLAS):

- report on activity in LLAS, noting that sustainability "is inherently culture-bound and is not merely a technical concern for certain other disciplines"
  See: http://www.llas.ac.uk/projects/2315
- audit of the relations between Languages, Linguistics and Area studies and ESD.

See: http://www.llas.ac.uk/resources/3294

Law:

- 'Teaching environmental law, ethics and sustainability' case study (see: http://www.ukcle.ac.uk/resources/sustainability/masters/);
- workbook integrating sustainability concepts in legal system and method (see: http://www.ukcle.ac.uk/resources/sustainability/workbook/).

See: http://www.ukcle.ac.uk/resources/sustainability/esd/

Materials:

- student essay competition, asking, 'How can Materials Science help save the planet from environmental disaster?'

See: http://www.materials.ac.uk/features/essaycompwin2010.asp

Philosophical and Religious Studies:

- survey looking at philosophy and ESD. One finding showed that Religious Studies emphasises the ways in which the teachings and practices of different world religions intersect with sustainability concerns (see: http://prs.heacademy.ac.uk/projects/esd/index.html#2)

- 'Sustainability in the Theology Curriculum' by Katja Stuerzenhofecker, Rebecca O'Loughlin and Simon Smith, which is chapter 12 from *Sustainability Education: Perspectives and Practice across Higher Education* (Jones *et al*. 2010),

See: http://prs.heacademy.ac.uk/view.html/prsdocuments/554

Physical Sciences:

- 'Green chemistry' educational board game project.

See: http://www.heacademy.ac.uk/physsci/home/pedagogicthemes/sustainabledevelopment

Psychology:

- 'Embedding education for sustainable development (ESD) into the psychology curriculum'.

See: http://www.heacademy.ac.uk/projects/detail/esd/esd_cooke_aston

Social Policy and Social Work:

- 'Students as Mentors: Changing the Next Generation' project;
- student essay competition: 'Sustainability literacy is a current buzz phrase; what does it mean to you and how does it impact on your life as a student?'.

See: http://www.swap.ac.uk/themes/esd.html

10 Simple change tools

This section offers some simple tools and questions to help you begin to make changes happen.

The sustainability agenda requires a response, and many academics – and indeed, increasingly whole institutions – are taking steps to rethink and redesign teaching and learning strategies and programmes to take account of it. While change at this level may be difficult and complex, small steps can often be made that can in time lead to deeper change.

This section offers some simple frameworks and prompts that can be used to stimulate thinking about how change processes towards ESD can be initiated.

10.1 The '4 Rs model'

This is a very simple but effective 'first step' model.

With sustainability in mind: take any document at any level – from university corporate plan to lecture plan, and anything in between (e.g. teaching and learning strategy; faculty policy, programme aims and objectives, etc.) – then use this simple model to assess, evaluate and discuss possible changes with appropriate colleagues.

Regarding **what we do now:**

- What is of value that we need to **keep?**
- 'It is useful, valid, up to date and relevant.'
- **Retain**

- What might need **modification?**
- 'It is partly all the above – but needs some updating or revision.'
- **Revise**

- What, if anything, might we need to **abandon?**
- 'It's outdated or no longer relevant or valid.'
- **Reject**

- What **new ideas**, concepts, principles, methodologies, working methods, pedagogies, etc. are needed?
- 'We need to innovate and bring in new material.'
- **Renew**

This can be used as a tool for helping audit existing provision (see Appendix 6 'A basic ESD audit tool') and to inform discussion with colleagues.

10.2 Four key questions: getting the discussion going

These questions can be used as a basis for discussion and reflection on an individual, group or institutional level.

1. In what ways do you currently include or promote sustainability concepts, values and skills in your curriculum area?

- What is the student view?
- What are your main achievements or successes to date?

2. What more could you/would you like to do?

- In what way(s) could you contribute more effectively and directly to student learning in relation to sustainability?

3 .What opportunities and barriers are there currently?

- What factors are assisting you in this, and which are hindering progress?

4. What kinds of support might you need to take this work further?

- What needs to change to help you go further, and/or what support might you need?

See Appendix 6 'A basic ESD audit tool' to help with this process.

10.3 What can I do today, next week ...?

Engagement can be at any level from minor to major change – depending on what's possible and appropriate in your circumstances. For example:

1. **What you can do today** – introduce a ten or 20 minute 'podule' on some aspect of sustainability or ask your students to present on some aspect of sustainability that affects their lives.

2. **What you can within a week or two** – make minor modifications to your teaching within your existing module(s).

3. **What you can do in a few months** – revise existing modules to take account of sustainability.

4. **What you can do over a year or so** – redesign programmes for validation.

10.4 Curriculum strategies

In sum, try one or more of these:

- introduce new 'podules' (see above);
- minor modifications to your teaching or modules;
- put ESD in PDP;
- cross-disciplinary and extra-curricular events;
- dissertations, projects and workplace learning placements;
- infuse sustainability in assessment;
- develop new modules;
- generic or common modules;
- new programmes;
- invite external speakers in;
- mount extra-curricular events, film showings, lectures etc.

11 Teaching/CPD activities

Some suggested teaching activities

This section presents a selection of activities that can be used to introduce ESD in student sessions and/or Continued Professional Development (CDP) sessions, developed by the Centre for Sustainable Futures at Plymouth University. They are accessible by hyperlink.

Activity 1 Sustainability is...

Activity 2 Tackling a Statement

Activity 3 Diamond Ranking

Activity 4 Tackling a Question

Activity 5 Reactions

Activity 6 Woolly Thinking

Activity 7 Where do we draw the line?

Activity 8 Futures Bag

Activity 9 Weighting Statements about the Future

Activity 10 Future Time Lines

Activity 11 Rights Continuum

See: http://csf.plymouth.ac.uk/?q=node/579

The business community is a good source of participative and interactive learning methods and techniques. These activities can be accessed from http://hdl.handle.net/10293/1587, go to 'Sustainability Interactive Learning Models'.

Developing sustainability literacy: eight dimensions, eight questions

The following eight generic dimensions and questions can be used, adapted and refined in a teaching situation to help develop sustainability literacy in relation to sustainability related issues or problems. Around any issue, ask:

Holistic: 'How does this relate to that?' 'What is the larger context here?'

Critical: 'Why are things this way, in whose interests?'

Appreciative: 'What's good, and what already works well here?'

Inclusive: 'Who/what is being heard, listened to and engaged?'

Systemic: 'What are or might be the consequences of this?'

Creative: 'What innovation might be required?'

Ethical: 'How should this relate to that?' 'What is wise action?' 'How can we work towards the inclusive wellbeing of the whole system – social, economic, and ecological?'

Practical: 'How do we take this forward with sustainability in mind as our guiding principle?'

Based on Sterling (2010).

12 Research and ESD

This section gives brief examples of how research can be developed around sustainability teaching and learning.

Pedagogic research has an important role in monitoring and evaluating the effectiveness of ESD provision and pedagogy. For example, research might look at such areas as:

- How far does ESD provision lead to critical awareness of students' values and world views, and those of others?
- What is the impact on student learning of work-based learning, of community engagement, of work using the campus as a learning resource, etc.?
- What is the effect and affect of different pedagogic approaches on student learning?
- What is the place and possibility of transformative learning in the context of HE?
- In what ways can students' sustainability literacy and values be enhanced, developed and evidenced?
- How can inter- and trans-disciplinary learning be effected, and what difference does it make to the learner?
- To what extent does informal learning through volunteering or other activities impact on students' understanding of sustainability? What is the impact of the campus environment and other aspects of the 'hidden curriculum' on student learning about sustainability?

There is a flourishing literature on ESD research, much of it around teaching and learning. See for example key journals such as *Environmental Education Research*, the *Journal of Education for Sustainable Development* and the *International Journal of Sustainability in Higher Education.* Also look out for sustainability-related papers in your own subject area journals.

13 Resources

Some key websites, help guides, policy papers and reports, books, and North American websites are outlined below.

13.1 Key websites

- The Higher Education Academy: http://www.heacademy.ac.uk/ourwork/teachingandlearning/sustainability
- Environmental Association for Universities and Colleges (EAUC): http://www.eauc.org.uk/resource_bank
- Forum for the Future: http://www.forumforthefuture.org.uk/
- HEFCE's online resource for sustainable development in HE: http://www.hefce.ac.uk/susdevresources/
- Key Welsh site on ESD and global citizenship: http://www.esd-wales.org.uk/english/higher_ed/higher_ed.htm
- Change Agents UK (formerly StudentForce for Sustainability): http://www.changeagents.org.uk/
- Centre for Sustainable Futures: http://www.csf.plymouth.ac.uk/
- Learning and Skills Improvement Service (for sustainability in FE sector): http://www.lsis.org.uk/Services/support-improvement/Documents/Sustainability%20resources.pdf
- Learning in Future Environments: http://www.thelifeindex.org.uk/
- Sustainability Online Resource and Toolkit for Education (SORTED): http://www.eauc.org.uk/sorted/home
- University of Bradford Ecoversity: http://www.brad.ac.uk/academic-development/ecoversity/esd-research/

- The OSIER project (Open Sustainability in Education Resource): http://osier.ac.uk. See also http://esdgc.escalate.ac.uk/

- Universities and Colleges Climate Commitment for Scotland (UCCCFS) http://www.eauc.org.uk/ucccfs/home

13.2 Help guides

- University of Gloucestershire (2009) Education for Sustainability – a Draft Framework for the University of Gloucestershire http://www2.glos.ac.uk/offload/staff/news/efsframeworknov09.pdf

- The Higher Education Academy UK Centre for Bioscience 'How to make your teaching more sustainable' sheets (relevant to all subject areas) http://www.bioscience.heacademy.ac.uk/resources/esd/howto.aspx

- EAUC (2009) Embedding sustainability in the curriculum http://www.eauc.org.uk/sorted/files/embedding_sustainabilyt_in_the_curriculum_guide.pdf

- Haslett, S. (ed.) 2011, Pedagogy of Climate Change. York: Higher Education Academy. http://www.gees.ac.uk/pubs/other/pocc/pocc.htm

- LSC/ESD Consulting (2009) Creating the conditions for embedding SD in the curriculum http://www.eauc.org.uk/sorted/files/esd-conditions__1.pdf

- LSC/ESD Consulting (2009) Embedding SD in the curriculum http://www.eauc.org.uk/sorted/files/esd-embedding_1.pdf

- LSIS, LSIS Sustainability Leaders' Toolkit http://www.excellencegateway.org.uk/sustainability

- UCU (2010) Guidance Leaflet No. 1: 'Education for Sustainable Development' http://www.ucu.org.uk/media/docs/t/l/UCU_Guidance_'ESD'2.doc

- Sterling, S. et al. (2008) Sowing Seeds: How To Make Your Modules A Bit More Sustainability Oriented: A help guide to writing and modifying modules to incorporate sustainability principles. Plymouth: Centre for Sustainable Futures, Plymouth University. http://csf.plymouth.ac.uk/files/Sowing%20Seeds%2013%20June%202008.pdf

13.3 Key policy papers and reports

- BIS (2009) Sustainable development action plan 2009-11 http://www.bis.gov.uk/assets/biscore/business-sectors/docs/09-p59-bis-sustainable-development-action-plan-2009-11

- Brooks, C. and Ryan, A. (2008) Education for Sustainable Development Interdisciplinary Seminar Series. Higher Education Academy ESD Project. http://www.heacademy.ac.uk/assets/documents/sustainability/interdisc_discuss_series2008.pdf

- Brooks, C. and Ryan, A. (2008) ESD: Strategic Consultations among English HEIs See: http://www.heacademy.ac.uk/ourwork/teachingandlearning/alldisplay?type=projects&newid=esd/esd_EnglishHEIs&site=york

- Colley, H. (2009) Education for sustainable development and global citizenship (ESDGC): Review of a curriculum audit in Wales. York: Higher Education Academy http://www.heacademy.ac.uk/assets/York/documents/aboutus/wales/ESDGC_Wales_June_2009.pdf

- The Higher Education Funding Council for England (HEFCE)(2009) Sustainable development in higher education - 2008 update to strategic statement and action plan http://www.hefce.ac.uk/pubs/hefce/2009/09_03/

- Holmberg, J. and Samuelsson, B.E. (eds.) (2006) Drivers and Barriers for Implementing Sustainable Development in Higher Education. Göteborg Workshop December 7-9, 2005. Education for Sustainable Development in Action; Technical Paper N° 3, pp. 61-67. Paris: UNESCO. http://unesdoc.unesco.org/images/0014/001484/148466E.pdf

- Policy Studies Institute, PA Consulting Group, Centre for Research in Education and the Environment (2008) Strategic Review of Sustainable Development in Higher Education in England. Bristol: HEFCE. http://www.hefce.ac.uk/pubs/rdreports/2008/rd03_08/

- Ryan, A. (2009) 2008 Review of Education for Sustainable Development (ESD) in Higher Education in Scotland – Final Report. York: Higher Education Academy. See: http://www.heacademy.ac.uk/assets/York/documents/ourwork/sustainability/SFCesd08Review.pdf

- Scottish Government (2010) Learning for Change: Scotland's Action Plan for the Second Half of the UN Decade of Education for Sustainable Development: http://www.scotland.gov.uk:80/Publications/2010/05/20152453/0

- SQW (2009) Education for Sustainable Development and Global Citizenship (ESDGC): Analysis of Good Practice in Welsh Higher Education Institutions. A report to the Higher Education Funding Council for Wales (HEFCW). See: http://www.hefcw.ac.uk/documents/about_he_in_wales/wag_priorities_and_policies/SQW%20ESDGC%20Final%20Report.pdf

13.4 Useful books

- Blewitt, J. and Cullingford, C. (eds.) (2004) The Sustainability Curriculum: The Challenge for Higher Education. London: Earthscan.
- Corcoran P.B. & Wals, A. (eds.) Higher Education and the Challenge of Sustainability: Contestation, Critique, Practice, and Promise. Dordrecht, Kluwer Academic.
- Chambers, R. (2002) Participatory Workshops: A Sourcebook of 21 Sets of Ideas and Activities. London: Earthscan.
- Jones, P., Selby, D. and Sterling, S. (eds.) (2010) Sustainability Education: perspectives and practice across higher education. London: Earthscan.
- Meadows, D. (2009) Thinking in Systems – A Primer. London: Earthscan.
- Rickinson, M., Lundholm, C. and Hopwood, N. (2009) Environmental Learning, Insights from research into the student experience. London, New York: Springer.
- Roberts, C. and Roberts, J. (2007) Greener by Degrees: Exploring Sustainability through Higher Education Curricula. Centre for Active Learning, University of Gloucestershire. http://resources.glos.ac.uk/ceal/resources/greenerbydegrees/index.cfm
- Scott, W. and Gough, S. (2008) Higher education and sustainable development: paradox and possibility. London: Routledge.
- Stibbe, A. (2009) The Handbook of Sustainability Literacy – Skills for a changing world. Dartington: Green Books. (See also linked website: http://www.sustainability-literacy.org/)
- Tilbury, D. and Wortman, D. (eds.) (2004) Engaging People in Sustainability. Cambridge: IUCN. http://www.unece.org/env/esd/information/Publications%20IUCN/engaging%20people.pdf

13.5 Useful web resources – USA and Canada

- Association for the Advancement of Sustainability in Higher Education: http://www.aashe.org/
- Centre for Sustainable Community Development, Simon Fraser University: http://www.sfu.ca/cscd/
- Disciplinary Associations Network for Sustainability: http://www2.aashe.org/dans/resources.php
- Education for Sustainable Development Toolkit: http://www.esdtoolkit.org
  Includes an introduction to sustainability, a description of the major thrusts and components of education for sustainable development, and a discussion of 12 major issues that have slowed the progress of ESD. It lists links to other websites on sustainability, education for sustainability, historic United Nations documents, and communities that have developed sustainability plans.

- The International Institute for Sustainable Development (IISD): http://www.iisd.org/
  An interactive toolkit to introduce some of the basic concepts of sustainable development and ways these concepts are put into practice in institutions. A section on indicators and measurement shows how to track progress towards sustainability.

- Teaching and Learning for a Sustainable Future (a UNESCO site):
  http://www.unesco.org/education/tlsf/
  This is a multimedia, interactive professional development program with materials, exercises and links that help educators deepen their understanding of education for sustainability and its importance in addressing the economic, social and environmental issues of the world.

- Second Nature: http://www.secondnature.org
  This site offers guidance and assistance to institutions of higher education in their efforts to make sustainability an integral part of the institution and expand sustainability into personal and community life.

- Campus Ecology: http://www.nwf.org/campusecology/index.cfm

- University Leaders for a Sustainable Future (ULSF): http://www.ulsf.org/

- Sustainable Development on Campus: Tools for Campus Decision Makers:
  http://www.iisd.org/educate/

- The Sustainability Education Center: http://www.sustainabilityed.org/

- Sustainability Office, University of British Columbia (UBC): http://www.sustain.ubc.ca/
  The Sustainability Office of UBC promotes, co-ordinates and implements very effective sustainability practices.

- Environmental Education and Training Partnership: http://www.eetap.org/
  Resources on environmental literacy.

- National Environmental Education Foundation: http://www.neefusa.org
  Audit tools on environmental knowledge, attitudes and behaviours.

- North American Association for Environmental Education: http://www.naaee.org/

13.6 International ESD

For a single source of information, case studies and literature review see:

- Tilbury, D. (2011) Assessing ESD Experiences during the DESD: An expert review on processes of learning for ESD. Paris: UNESCO.
  http://unesdoc.unesco.org/images/0019/001914/191442e.pdf

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http://www.bitc.org.uk/resources/publications/leadership_skills.html (last accessed May 3,2011).

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This Framework was written by Professor Stephen Sterling, Centre for Sustainable Futures (CSF), Teaching and Learning Directorate, Plymouth University, on behalf of the Higher Education Academy (HEA).

The assistance of Heather Luna of the HEA ESD Project and of Joanna Blake of CSF with research is gratefully acknowledged. Further, we would like to thank colleagues from the universities of Plymouth, Exeter, Leicester and Bath, and from the Plymouth College of Art, who kindly gave feedback on earlier drafts.

Appendices

Contents

1 Future Fit Framework – feedback sheet

Your feedback on this Framework is very much welcomed and will help us improve it. Please scan, or request a Word version from sustainability@heacademy.ac.uk.

1. The Framework fills a gap in the literature on how to implement sustainability education

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

Please elaborate if you wish.....

2. The Framework is informative

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

Please elaborate if you wish.....

3. The Framework is/will be useful to me

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

Please elaborate if you wish.....

4. The Framework is/will be useful in introducing ESD to my colleagues

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

Please elaborate if you wish.....

5. The Framework doesn't cover all the areas it should

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

Please elaborate if you wish.....

6. The Framework is easy to navigate

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

Please elaborate if you wish.....

7. The strengths of the Framework are.....

8. The weaknesses of the Framework are.....

9. My suggestions to improve the Framework are.....

10. Other comments?.....

Thank you very much for completing this feedback form. Please copy into an email and send to sustainability@heacademy.ac.uk.

2 Embedding ESD in the HE curriculum – drivers and limiters

Drivers	Limiting Factors
– Government legislation and coalition targets – Funding Council mandates – Economic climate – drive for low carbon economy and green jobs – Growing demand from employers for sustainability related skills – Financial benefits from resource efficiencies – Global challenge and moral imperatives – contribution of HE to secure future – Student demand for sustainability dimension in HE including CSR and courses – Research focus on rising sustainability issues – University strategy (where it features) – Carbon Reduction Commitment and fear of fines – Increasing pool of committed individuals – Increasing pool of accessible experience – Well-functioning ESD networks – Greening of estates encourages curriculum response – Level of sustainability awareness among school leavers/university entrants – Professional bodies interest where applicable – International initiatives (e.g. UN Decade of ESD) and best practice	– Lack of clarity regarding meaning and importance of ESD – Lack of clarity regarding implications for curriculum – Apprehension by academics regarding taking on areas beyond comfort zone and lack of holistic perspectives – Silo structures reduce communication – Costs of changes and financial climate – Doubts by senior management about stability of Funding Council/Government policy and of 'demand' regarding sustainability provision – Pragmatic/immediate employability issues – Lack of staff expertise – Lack of staff time and incentives – Lack of leadership and short-termism – Dominance of disciplinarity – Timescale of programme change and validations – Perception: uninterest by students, and questioning of academic legitimacy by academics – Inertia – Minority of professional bodies stipulate sustainability content – Relative lack of QAA benchmarks

Based on workshop 'The Role of Curriculum in Institutional Change' at *Tomorrow's Sustainable Universities,* University of Bradford, 15-16 July 2010.

3 Embedding ESD in the curriculum – tactics and ideas

	Short term	Medium term	Longer term
Easy/low risk	Hold awareness-raising, well-publicised events or seminars Harness third-year students to come up with ideas for campus developments Develop business case	Set up projects that showcase good practice Link carbon management strategies to curriculum Develop sustainability student placements	Host 'green lunches' to encourage informal discussions Use knowledge transfer to validate academic legitimacy of ESD

	Short term	Medium term	Longer term
Moderate difficulty/medium risk	Provide workshops for academics with support from senior management to develop creative thinking Develop curriculum audit Research student/ staff attitudes to SD	Get senior management explicit support – energise the 'champions' Engage with external stakeholders – e.g. interested employers Be aware and work on 'the hidden curriculum' regarding consistency with taught curriculum Construct staff development programme on ESD themes Use student placements to work on ESD/SD projects 'Walk the talk' regarding campus operations	Develop links and synergies with other agendas: employability; enterprise; internationalisation; corporate social responsibility; research profile, etc. Build into research impact statements

	Short term	Medium term	Longer term
Harder/higher risk		Build ESD into institutional strategies and policies including teaching and learning Build sustainability literacy into PDP and graduate attributes policy Recycle funds saved from sustainability initiatives (e.g. Carbon Reduction Commitment) to ESD curriculum development Allocate time and support for curriculum development around ESD	Facilitate links with schools to enable ideas around SD to develop Link programme review and course approvals to sustainability criteria Link appointments to sustainability criteria

Based on workshop 'The Role of Curriculum in Institutional Change' at *Tomorrow's Sustainable Universities,* University of Bradford, 15-16 July 2010.

4 The University of Melbourne Graduate Attributes Statement

The Melbourne Experience enables our graduates to become:

Academically excellent:

- have a strong sense of intellectual integrity and the ethics of scholarship
- have in-depth knowledge of their specialist discipline(s)
- reach a high level of achievement in writing, generic research activities, problem-solving and communication
- be critical and creative thinkers, with an aptitude for continued self-directed learning
- be adept at learning in a range of ways, including through information and communication technologies

Knowledgeable across disciplines:

- examine critically, synthesise and evaluate knowledge across a broad range of disciplines
- expand their analytical and cognitive skills through learning experiences in diverse subjects
- have the capacity to participate fully in collaborative learning and to confront unfamiliar problems
- have a set of flexible and transferable skills for different types of employment

Leaders in communities:

- initiate and implement constructive change in their communities, including professions and workplaces
- have excellent interpersonal and decision-making skills, including an awareness of personal strengths and limitations
- mentor future generations of learners
- engage in meaningful public discourse, with a profound awareness of community needs

Attuned to cultural diversity:

- value different cultures
- be well-informed citizens able to contribute to their communities wherever they choose to live and work
- have an understanding of the social and cultural diversity in our community
- respect indigenous knowledge, cultures and values

Active global citizens:

- accept social and civic responsibilities
- be advocates for improving the sustainability of the environment
- have a broad global understanding, with a high regard for human rights, equity and ethics

See: http://www.qmul.ac.uk/docs/gacep/44631.pdf.

5 Indicative list of sustainability concepts

In no particular order ... (see also Section 7.2 'Values' in the main guide):

Carrying capacity	Environmental law	Biodiversity
Biocapacity	Climate change	Population
Ecosystem health	Green transport	Millennium Development goals
Ecological footprint	Low carbon economy	Participative democracy
Carbon footprint	Energy descent	Social inclusion
Corporate social responsibility	Renewable and non-renewable energy	Meeting needs locally
Sustainable economies	Sustainable construction	Sustainable and transition communities
Environmental limits	Natural resource and full cost accounting	Sustainable systems
Sustainable consumption	Adaptive management	Resilience
Cultural diversity	Eco efficiency	Health and well-being
Global citizenship	Waste and pollution	Ethical trading and investment
Social and environmental justice	Community regeneration	Social and natural capitals
Ecological design	Human rights	Futures scenarios
Sustainable food and farming		

List developed by Centre for Sustainable Futures, Plymouth University, UK

6 A basic ESD audit tool

*Reproduced with the permission of GEES, the HEA Subject Centre for Geography, Earth and Environmental Sciences (*http://www.gees.ac.uk).

Listed below are some questions that may help you to assess how effectively sustainable development (SD) issues are addressed in your institution and, most especially, within your course(s).

Score 2 for strongly achieved, 1 for satisfactory and 0 for not achieved. Use 'DK' if you are not sure of the answer.

1. Does contributing to SD feature in your institution's mission/values statement or corporate plan?
2. Does the institution have a sustainability strategy?
3. Does ESD feature in the institution's L&T strategy?
4. Does the development of students' 'sustainability literacy' (or something similar) feature in your programmes' aims?
5. Has your course team discussed which SD issues should be addressed and where within the programme?
6. Do students in practice learn about the key SD issues?
7. Has SD/ESD been 'mapped' across the curriculum?
8. Do issues of global citizenship feature in the curriculum?
9. Are university and local community SD issues featured?
10. Is ESD addressed through your PDP system?
11. Does ESD play a part in field and project work?
12. Are students encouraged to undertake SD volunteering?
13. Would your students know how to help 'green' an organisation?
14. Would they know how to assess and reduce their own 'footprint'?

7 The Higher Education Academy's work in education for sustainable development

The Higher Education Academy (HEA) has been supporting the sector in ESD since the beginning of the UN Decade for ESD. Our vision for the sector is that:

> *Institutions and subject communities develop curricula and pedagogy that enhance graduates' capabilities to contribute to sustainable and just societies.*

Our mission to achieve this vision is "to provide strategic leadership for ESD in the HE sector".

Higher education can help students in many ways: through research-teaching linkages, interdisciplinary approaches to the undergraduate curriculum, developing graduate attributes such as global citizenship, through student engagement and empowerment and the quality agenda.

The principal aims of the HEA's work are:

1. To make a leading contribution to evidence-informed development of ESD policy and practiceacross the HE sector.

2. To build capacity among individuals, subject communities and institutions to embed ESD in curricula and pedagogy and support strategic change across the HE sector.

3. To develop strategic and operational partnerships with key stakeholders across professional, business and community sectors.

4. To stimulate the dissemination of ESD policy, research and practice across HE and the professions.

We work in partnership with a number of key stakeholders and organisations including Government, Funding Councils, National Union of Students (NUS), the Environmental Association for Universities and Colleges (EAUC), college and schools sectors, as well as HEIs, their staff and students.

See: http://www.heacademy.ac.uk/ourwork/teachingandlearning/sustainability.

An interactive online version of the Framework is made up of a series of video clips which show Stephen Sterling, the author of the Framework, explaining key aspects of it. You can also watch feedback from two workshops on what colleagues thought of the Framework.

See: http://xerte5.techdis.palepurple.co.uk/play_8655

Produced by the Centre for Sustainable Futures, Teaching and Learning Directorate, Plymouth University, for the Higher Education Academy.
July 2011

Contact us

The Higher Education Academy
Innovation Way
York Science Park
Heslington
York
YO10 5BR

+44 (0)1904 717500
enquiries@heacademy.ac.uk

The HEA is a national body for enhancing learning and teaching in higher education in the UK. We work with institutions across the HE system to help bring about change in learning and teaching to improve the outcomes for students. We do this by recognising and rewarding excellent teaching, bringing together people and resources to research and share best practice and by helping influence, shape and implement policy.

The HEA supports staff in higher education throughout their career from those who are new to teaching through to senior management. We offer services in 28 disciplines throughout the UK and have offices in England, Wales and Scotland. Through the partnership management team we work directly with institutions to understand individual circumstances and priorities and bring together resources to meet them.

The HEA has knowledge, experience and expertise in higher education. Its service and product range is broader than any other competitor, and it is trusted to deliver HE system advancements in partnership with its member institutions.

To request copies of this report in large print or in a different format, please contact the communications office at the Higher Education Academy: 01904 717500 or pressoffice@heacademy.ac.uk