Sustainable Development in Higher Education: Current Practice and Future Developments

A report for The Higher Education Academy

November 2005

"The human assault on the terrestrial environment shows no signs of abating and some signs of spilling over into non-terrestrial environments. … Many are appalled by this destruction … because of what it implies for themselves, their children, their friends, other creatures, the biomass [global nature], and the planet we inhabit. This response is in many instances an ethical response. People judge that what is occurring is not merely irritating, inconvenient, disappointing, or unfortunate, but immoral, bad, wrong or evil."

Elliot, 2001. Normative ethics. In: (editor, D. Jamieson) *A Companion to Environmental Philosophy*.

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Executive Summary

The UK's new sustainable development strategy — *Securing the Future: delivering the UK sustainable development strategy* (2005) emphasises the role that education can play in both raising awareness among young people about sustainable development and giving them the skills to put sustainable development into practice. It places priority on the development of sustainability literacy as a 'core competence' among graduates. A similar emphasis is provided by the United Nation's commitment to a Decade of Education for Sustainable Development 2005-2014.

The Higher Education Academy has responded by commissioning:
(i)   This study, *'Sustainable Development in Higher Education: Current Practice and Future Developments'* and
(ii)   Individual projects to be undertaken by participating Subject Centres[1] (SC) to examine the status and understanding of Education for Sustainable Development (ESD) in their subject communities. These were carried out separately but their results have been incorporated into this report.

This report is the culmination of a six-month investigation into how different subject disciplines taught within the higher education system are contributing to creating sustainability literate[2] graduates. By undertaking such an investigation, the Academy sought to identify good practice in approaches to teaching and curriculum development; what barriers exist in embedding sustainable development in institutional teaching and learning strategies; as well as assessing the support required for widening and deepening the embedding process.

The approach adopted throughout the research has been non-prescriptive, open and participatory.

The report is a quick assessment of the current state of ESD, not a comprehensive review. Nevertheless it represents the first interdisciplinary and integrated investigation into ESD and its implementation within Higher Education Institutions (HEIs) within the UK.

Key Findings

Teaching and learning

The research found that most of the disciplines represented by the Academy's 24 Subject Centres are making a contribution to the sustainability literacy of their students. But it is a dynamic and changing picture with many academic staff recognising ESD as an important component of the development of their respective subjects, and by inference what is taught and how. The state of progress can be summarised as follows: substantial work in progress, a range of good practice, but overall a patchy picture with sustainable development being marginal or non-existent in some influential disciplines but increasingly higher profile in others. There is universal acknowledgement that a wide-range of skills and knowledge are required to create an action orientated sustainability literate graduate body.

Many of these skills and attributes are not easy to teach in a traditional sense, but there are a growing number of examples of new teaching orientations or approaches which support the development of such skills as interdisciplinary thinking and problem solving and team working. The research revealed three prevailing orientations in the teaching of sustainable development:

- Educators as role models and learners. This orientation places an emphasis on how the tutor can act as a role model for students in order to offer a credible and authoritative perspective on the realities of putting sustainability principles into practice.

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[1] Subject Centres deal with the main academic subjects taught within HE, from art, design and communication (ADC), through mathematics, statistics and operational research (MSOR), to psychology, social policy and social work (SWAP). They engage in a wide variety of activities to support tutors in their work.
[2] Sustainability literacy is about learning how human actions affect the immediate and long-term future of the economy and ecology of our communities. It is concerned with how we can learn to live and work on a planet whose resources are finite.

- Experiential learning by reconnecting to real-life situations. This orientation focuses on real and practical life issues and actual experiences as learning situations.
- Holistic thinking. Many of the skills and knowledge for sustainable development are associated with complex, multi-layered and interconnected systems. This approach encompasses a more open-ended exploration of interdependency and transdisciplinary connections between subjects as well as including approaches to developing and honing critical thinking.

Curriculum Responses

The research survey identified a wide-range of curricula connections in response to the sustainability agenda. Several disciplines have introduced relevant themes such as climate change, biodiversity and environmental management systems. However, the overall picture is patchy with major gaps in areas such as sustainable production and consumption, eco-efficiency and national and international sustainable development policy.

The survey identified three categories of response to ESD by subject disciplines:

- Subject disciplines[3] that have adopted a major process of embedding ESD curricula into undergraduate and post-graduate programmes. Examples include Engineering and Materials subjects which are dealing with the day to day realities of industrial processes, English with its strong tradition of 'eco-literacy' and Geography, Earth and Environmental Sciences.

- Subject disciplines that have made some limited progress in embedding ESD into their curricular although acknowledging that these disciplines have some significant curricular content opportunities to do so. Examples include Biosciences, Economics, Hospitality, Leisure, Sport and Tourism, Philosophy and Religious Studies.

- Subject Centres that have an interest in ESD, but have found it much more difficult to embed ESD widely or deeply into their curricula. Examples include Information and Computer Sciences and Mathematics, Statistics and Operational Research, Performing Arts and Psychology.

Best practice examples elicited from the survey can be characterized in two specific ways:

1. Those subjects which were extending the boundaries of their discipline to include other unrelated disciplines e.g. sciences and humanities.

2. Those subjects which have a close and continuing association with their institution's environmental processes and practices.

Barriers and Solutions to Embedding ESD

The research revealed four major barriers to the successful embedding of ESD into many of the subject disciplines in HE:

1. Overcrowded curriculum.
2. Perceived irrelevance by academic staff.
3. Limited staff awareness and expertise.
4. Limited institutional drive and commitment.

At one extreme the arts and humanities identified the largest number of barriers, whereas sociology, the built environment and environmental sciences identified relatively few. For example, performing

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[3] Within this report, Subject Centres were mostly consulted via Focus Groups which also included several subject practitioners (representatives of disciplines) as well as the Subject Centre manager. Occasionally Subject Centre managers were consulted directly. In general the terms Subject Centre and subject discipline refer to such groupings and the terms are used interchangeably. For more detail see Appendices 6 and 7.

arts subjects identified at least ten barriers, ranging from awkward fit with the subject area to lack of staff expertise, irrelevance, financial restrictions and limited institutional commitment. English, with nine barriers, were particularly concerned with the difficulty in translating ecological concepts into literary theoretical concepts. Other subject areas raised the issue of sustainable development having limited academic rigour and problems with internal validation and accreditation systems.

Solutions

Subject Centres identified a number of solutions to the barriers identified shown below.

Barrier	Solution
Crowded curriculum	Create space through a rigorous review of existing curricula
Irrelevance	Development of credible teaching materials which are fully contextualised and relevant to each subject area
Limited staff awareness and expertise	Significant investment in staff development and capacity building
Limited institutional commitment	Develop a credible business case for HE institutions, setting out triple bottom line benefits.
	Review and amend institutional mission and policy statements

Report conclusions

This report sets out the current state of progress on embedding ESD in many of the subject disciplines taught within the higher education sector. It also identifies some of the barriers and their resolution. The significance of this report is that it is a reflection of the views of practitioners in the disciplines that make up the HE sector in the UK. Whilst the progress might appear patchy and limited in some important disciplines this research provides evidence of the strong underlying support for more action in support of the embedding process. To this end the report recommends that the Academy and its Subject Centres should strengthen the development of ESD in the following ways:

1. Support and funding should be provided to promote the development of ESD across all subject disciplines in HE, including the dissemination of good practice.
2. Action research should be commissioned to explore the connections between ESD and employability.
3. Action research should be commissioned into whether career opportunities and choices of HE graduates are being influenced by the SD agenda.
4. A stakeholder group should be established comprising employers, professional bodies and graduate careers to identify creative ways of implementing and supporting the integration of ESD to teaching, learning and the curriculum. The group should be tasked to develop a persuasive business case for creating sustainable universities.

Education for sustainable development is an emerging imperative. It represents a major shift in the way students are taught and learn within the higher education sector. It requires a broader and more flexible approach to the development and teaching of academic disciplines. Much of this change is in line with what graduates will need in an increasingly complex work environment. This is the challenge that the Academy and the Subject Centres it supports should address.

Introduction

Policy Context

1   The UN Decade of Education for Sustainable Development (DESD) 2005-2014 states that 'Universities must function as places of research and learning for sustainable development'[4]. The UK's new sustainable development strategy —*Securing the Future: delivering UK sustainable development strategy* (2005)— emphasises the role that education can play in both raising awareness among young people about sustainable development as well as giving them the skills to put sustainable development into practice. It argues that 'sustainable development principles must lie at the core of the education system, such that schools, colleges, and universities become showcases of sustainable development among the communities they serve'. It places a priority on the development of sustainability literacy as a 'core competence' among graduates.

2   This objective is at the heart of the *Sustainable Development Action Plan for Education and Skills* published by the Department for Education and Skills (DfES) in 2003. The plan sets out the actions required of schools, colleges, universities and national agencies like the Learning and Skills Council (LSC) and the Higher Education Funding Council for England (HEFCE) if we are to secure a more sustainable future for the economy, ecology and equity of all communities. Both the LSC and HEFCE will publish their own strategies for sustainable development (SD) later in 2005, following extensive consultation in their respective sectors (see www.hefce.ac.uk for more details).

3   The work in England was complemented by a Wales-wide strategy for Education for Sustainable Development and Global Citizenship, commissioned by the Welsh Assembly Government, which includes an Action Plan for mainstreaming ESD in the HE sector. In Scotland, a similar process has been started by the Scottish Executive asking the Scottish Higher Education Funding Council (SHEFC) to encourage institutions to implement ESD initiatives. The Higher Education Funding Councils for England, Scotland, Wales and Northern Ireland also funded the Higher Education Partnership for Sustainability (HEPS), work carried out by Forum for the Future[6] (Parkin et al., 2004). In addition, HEFCE also funded the Higher Education Environmental Performance Initiative (HEEPI) which is predominantly concerned with physical resource efficiency[7] within HEIs.

4   As part of this process of developing awareness and action on the SD agenda the Higher Education Academy[8] has responded by commissioning two related strands of work dealing with sustainability in the curriculum:
    1.   This investigation into the embedding of ESD entitled *'Sustainable Development in Higher Education: Current Practice and Future Developments'* and
    2.   A series of *Subject Centre ESD Development Projects* to be carried out by some of the 24 Subject Centres supported by the Academy.

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[4] DESD Draft International Implementation Scheme (IIS). UNESCO, 2004.
[5] Rt Hon Jim Wallace, Deputy First Minister & Minister for Enterprise and Lifelong Learning, Scottish Executive, letter to HE and FE funding Councils, 12/01/04, p. 2.
[6] www.forumforthefuture.org.uk
[7] For example, green procurement, energy efficiency, waste management, water efficiency, environmental management systems (EMSs). See www.heepi.org.uk
[8] The Higher Education Academy is an independent organisation whose mission is to support Higher Education institutions and subject discipline groups to provide the best possible learning experience for their students (www.heacademy.ac.uk).

5   Finally, the establishment of two Centres for Excellence in Teaching and Learning (CETLs) by HEFCE at HEIs offers further scope for complementarity and integration. These are:

        1. Centre for Sustainable Communities Achieved through Integrated Professional Education (C-SCAIPE). Lead institution: Kingston University.

        2. Centre for Excellence in Teaching and Learning for Education for Sustainable Development (ESD). Lead institution: University of Plymouth.

Why Undertake the Research?

6   Much has been written about approaches to teaching and learning in ESD but few attempts have been made to assess current practice across a sector of education. Hence this report represents an important and innovative step forward for the following reasons:

- This is the first interdisciplinary and integrated investigation into ESD and its implementation in Higher Education Institutions (HEIs), within the UK.
- It is a sector-wide attempt to examine the links between different disciplines, perceptions concerning different teaching approaches to ESD, and subject-specific connections with ESD.
- This research has been carried out within a practitioner-led and sustainable development policy context.

7   The purpose of this report is to identify good practice in order to provide guidance and information to academic staff on how to integrate sustainable development successfully into curricula in HEIs. It has involved an extensive consultation process with many of the academic Subject Centres by facilitated focus group discussions and direct feedback from Subject Centres, and by face to face interviews with selected tutors of ESD at HE level.

8   The research assesses current national and international developments in ESD.

The Approach

9   The approach adopted throughout this research was non-prescriptive, open and participatory. This reflects both the underlying philosophy of sustainability, the novel state of sustainability in some of the subject areas, and the need to encourage and sympathetically foster the development of ESD.

10   The research was both 'top-down' and 'bottom-up' in terms of assessing views and perceptions of ESD from the Subject Centres and individual tutors, and relating this to current sustainable development policy.

Aims and Objectives & Key Parameters of Research:

11   The aims and objectives of the research are summarised below (and in more detail in Appendix 1).

12   *ESD Curricular Orientation:*
- To identify definitions of ESD used by particular subject groupings.
- To identify content and connections between ESD and specific curricula areas.
- To identify core or common curricula for ESD.
- To assess how social implications of ESD are incorporated into curricula.

13 *ESD Teaching Approaches Orientation:*
- To identify the different approaches to teaching and learning in ESD.
- To identify emerging best practice models.
- To identify barriers and solutions in embedding ESD in teaching and learning.

14 An additional but secondary set of objectives was*:*
- To assess how ESD enhances the student experience.
- To assess how ESD might influence a student's career choices.

15 The principal research outcomes were as follows:
- To raise the profile of the ESD agenda within the sector and more specifically in the subject communities.
- To produce a readily useable resource for the sector as a whole.
- To communicate models of 'practice that works' in easily digestible and context sensitive ways.

Methodology

16 The report is based on a literature search (Appendix 5), a survey questionnaire sent to 24 Subject Centres (Appendix 2) and six Subject Centre focus group meetings (Appendix 7). Twelve of the Subject Centres returned the questionnaire (Appendix 6) and, largely using these returns, eight areas of emerging good practice were identified (Appendix 8).

Results

Literature Review

ESD Teaching and Curriculum Approaches

17   The literature and internet resources reviewed were dominated by the disciplines of engineering and teacher training. Sciences and humanities were represented to a smaller degree. Teaching, learning and curriculum development in the field of design was referred to in a small number of sources, as were business, economics, management, health-care, languages, politics and social sciences. Some subjects such as fine art and the performing arts, information and computer science, were represented by single monographs and papers (Appendix 5).

The approaches to teaching identified from the literature can be categorised as follows: *the personal* approach; *connecting*[9] or *re-connecting to reality;* and *holistic thinking*;

These are described in more detail below.

(1) The Personal

18   The personal approach places an emphasis on how the tutor can act as a role model, either positively or negatively to develop a deeper understanding of the sustainability agenda. It also encompasses the mutual learning that can take place between tutors and students through personal actions.

19   The literature in this category emphasises the importance placed on the roles and personal interests of tutors. The personal *convictions* of the tutor are essential to the whole process of integration of ESD. Some emphasised the need for ESD teaching to be reinforced, for students, throughout life; and gave examples of student role-play so they could view potential conflicts and possible pathways of resolution from a personal perspective. Some described, more radically, setting up learner-centred curricula, and even the need for students to 'own' ESD curricula. Here, it was argued that 'ownership' was the proper basis for deep ESD learning. There is also emphasis in the literature in defining learning outcomes, especially those dealing with personal responsibility to the environment, but these would be difficult to evaluate, and indeed, difficult to instil.

20   **Curricula examples:**

- *Engineering:* 'educational research studies increasingly demonstrated the need for student "ownership" of their programs as a basis for deep learning' (Bryce, Johnston and Yasukawa, 2004).

- *[Generic:]* 'Teaching young people to become…problem solvers requires…most of all that they become knowledge generators…two speakers helped link pedagogical issues to university practices and personal choices, stimulating

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[9] Some respondents preferred the term 'connecting' to 're-connecting' which has been used here.

participants to see the full range of dimensions of sustainability' (Barlett and Eisen, 2002).

- *Humanities:* [The students] 'should grow into independent, critically minded citizens, fully aware of the traditions, histories and ideologies which formed them and respectful of their responsibilities towards their communities and the biosphere' (Jucker, 2002).

- *Rural Environment:* 'Every student…should be able to…Recognise the environmental impact of personal choices and decisions and potential contribution to environmental solutions...' (Ali Khan and Peters, 1995).

- *Science and Technology:* [students are encouraged to consider] 'the dilemmas that can arise in trying to satisfy what are often conflicting obligations and loyalties…Each group…discusses the objectives and tactics required…after negotiation…each group presents its problem to a jury' (Blackmore, 1994)

(2) Re-connecting to Reality

21 This approach focuses on experiential learning and occasional variants of this, for example Problem-Based Learning. Included here were relationships to the local community, dealing with real life problems and experiences, re-connecting people to other people and nature, developing capacity among students to enact non-prescribed societal change, links with HE institutional Environmental Management Systems (EMSs).

22 The literature emphasises the need to encourage and involve students, from the earliest stages, in 'shaping their world', and to integrate university practices (e.g. EMSs) with personal choices. There was a broad consensus, throughout most of the subject areas reviewed, that physical and social connections with the local environment were very important in ESD. There were many examples of HEIs' environmental practices, particularly in the form of an EMS, being connected to the courses. In practical terms this implied effective student links with senior university management. Institutional commitment, exemplified perhaps by the adoption of an EMS, was, according to some, essential to success in ESD. However, most acknowledged that commitment should go further than this. Close range stakeholders, especially those living in the vicinity of large campuses, are important influencers in any successful institutional ESD strategy. There were examples of students and tutors coming into direct contact with natural systems (e.g. plants and animals) as part of ESD, of campus walks, or walks from the campus into surrounding nature (Barlett and Eisen, 2002). It was emphasised that tutors would need to be able to demonstrate their respect for nature, or to send 'the right message'. There was much emphasis on vocational training, on links between the HEI and Non-Governmental Organisations (NGOs), Small or Medium Sized Enterprises (SMEs), schools, and communities. There were also approaches to 'thinking outside the box' in many subject areas that hitherto had been too insular, or reductionist in approach.

23   Curricula examples:

- *Accounting: '*Some students find it difficult to relate a theoretically-based course with their other, more practical, studies. Others find this a rewarding challenge...' [and some students:] 'perhaps find that the course challenges their perception of what such an [accounting] career may mean.' [Environmental externalities are often not included in accounting courses, they are viewed as an anomaly] '...an accounting course would include the techniques for accounting for environmental impacts...and would have a vocational slant' (Holland, 2004).

- *Engineering:* 'The SD committee of [Delft University of Technology] suggested following an approach of 'learning by doing' and setting up pilot projects in each faculty' (Peet, Mulder and Bijma, 2004).

- *[Generic:]* 'This last project aims to involve students (willingly) in environmental projects, either at Technical University of Catalonia (UPC) or externally. The idea is to provide an opportunity to individual students who "want to do something for the environment", but also to establish a collaboration area between student associations, NGOs and other organisations, and UPC' (Ferrer-Balas, 2004).

- *[Generic:]* 'Its central idea is, through interdisciplinary group activity, to develop a concept of sustainable development for their own teaching and learning world – Dortmund University...The research object is...the university itself...From the sustainable use of campus eco-systems to the idea of a sustainable university management.' (Henze and Lob, 2000).

(3) Holistic Thinking

24   This approach emphasises the need to move from 'reductionist' approaches towards making interdisciplinary and systemic connections between disciplines. It also involves critical thinking so that students are able to identify and analyse the broader societal, economic and environmental connections for the subject area and demonstrate respect and sensitivity for all subject areas.

25   Inter-disciplinarity, trans-disciplinarity and cross-disciplinarity was agreed, by most commentators, to lie at the heart of successful ESD. However, it is evident that views differed widely about the virtues of each of these approaches. In practical terms, at some HEIs, tutors were encouraged to move physically from discipline to discipline as a requisite route to gaining the required inter-disciplinarity. Inter-subject and inter-departmental cooperation should be encouraged to enable more holistic thinking. Student benefits included gaining a sense of environmental responsibility, and their involvement in making critical judgements and becoming involved in organisational politics. One tutor emphasised how the connections between ecosystems and history, government, law, and policy making, issues of culture and global citizenship, social justice and economics, were at the heart of ESD (Simon, 2002). An orientation towards systems and problem solving, as well as communication and values and participation was also argued for. The overall aim, according to some, was to develop the teaching programme of the HEI as a kind of interdisciplinary 'superstructure' (Henze and Lob, 2000).

26 Curricula examples:

- *Accounting:* 'A more critical approach can also be adopted…in this way students begin to understand why business activity may be causing greater environmental and social impacts, and it then becomes important to review the alternatives to current practice…' [Contrasted with non-critical approach:] 'The student will…be prevented from examining how business organisations are implicated…in environmental destruction' (Holland, 2004).

- *Art, Design and Performing Arts:* [Kingston University/WWF project] 'students were asked to devise a model to enable others to understand complex environmental inter linkages through the medium of art. Fine Art was chosen as the host subject…' [School of Art, Univ. of Brighton: Life Arts project] [work is used to disarm and heal, not simply to illustrate and report on] 'conflict between our actions and the planet's capacity to endure…' (Goulding, 1994).

- *Built Environment:* [the aim of the course was to give students the] 'ability to see relationships within the subject areas learned and to perceive his/her field in a broader perspective' (Woods, 1994).

- *Engineering:* '…the modules and materials for teaching sustainability to engineering students must include not only technological analysis and economic evaluation, but also environmental and social considerations. This multidisciplinary approach has already been embodied in our teaching programmes, and we consider it to be essential' (Perdan, Azapagic and Clift, 2000).

- *[Generic:]* 'These [lectures relevant to ESD] include…an orientation towards systems and problem solving, as well as communication and values and participation…The total teaching programme of the university is given a kind of interdisciplinary superstructure.' (Henze and Lob, 2000).

A Framework for Investigating ESD Teaching Approaches

27 Based on the analysis of the literature through the three categories outlined above, we have created a framework to describe the range of teaching approaches that have been identified in the sources reviewed. We believe this framework is a useful device to support Subject Centres in their development of appropriate teaching approaches to ESD. We also believe that the framework is only a starting point and that it will evolve along with the emergence of new practice. The essential elements of the framework are described below:

(1) The Personal

28 (1) *Educators as Role Models:* This has been developed from the notion that it is important for tutors to involve themselves in exposing their lifestyle to student critiques, as an important factor in successfully embedding ESD within a given subject area. Without such exposure, tuition remains abstract and the student fails to grasp the full meaning of ESD. *Example:* Ferrer-Balas, 2004.

29 (2) *Teachers as Learners, Learners as Teachers:* This takes the above example further, into the realm of student group-work, and, at its most radical, student-centred curricula.

The proposition here is similar to the above, e.g. that the student has to be *fully involved* for deep learning to take place, and such involvement is enhanced via, for example, role-play and dealing with the realities of what is actually delivered in the course area. *Example:* Bryce, Johnston and Yasukawa, 2004.

30   (3) *Lifelong Learning:* Contact with teachers simply at undergraduate level is not likely to have long-term impact, unless it is reinforced by opportunities for lifelong learning. This relates to ESD being a vehicle for social change, and the need for students to keep informed of developments, or receptive to critiquing them. *Example:* Basile and Marlowe, 2002.

(2) Re-connecting to Reality

31   (4) *Relationships to the Local Community:* It is necessary to live and enact *changes here and now in our setting*. ESD is a local issue, which shouldn't be delegated or deemed unimportant in the face of global challenges. Change will never come about if we think only in the abstract: change happens by 'becoming fully present to those close enough to touch' (Illich and Rahnema, 1998, cited by Jucker, 2002). *Examples:* Barlett and Eisen, 2002; Ferrer-Balas, 2004.

32   (5) *Real Life Problems and Experiences:* Education has become ever more specialised and theoretical, far removed from the messiness of real life. ESD will therefore have to try to find real life problems and actual experiences as learning situations to avoid the kind of reductionist 'solutions' which have been witnessed since the Industrial Revolution. *Examples:* Holland, 2004; Peet, Mulder and Bijma, 2004.

33   (6) *Re-connecting People to People and Nature:* The last thirty years of environmental education has shown that lecturing to pupils and students does indeed increase environmental awareness, but this does not automatically translate into sustainable action. Only if you know something, love it, have an interest in it and develop responsibility towards it, will you care for it (Jucker, 2002). *Example:* Basile and Marlow, 2002.

34   (7) *Developing Capacity for Enacting (Non-Prescribed) Change:* To move towards sustainability, it has to be acknowledged that the current situation is unsustainable. Therefore, any learning that does not lead to individual behavioural and therefore social change is not successful. Yet this social change cannot be prescribed: ESD should develop the capacity for change, rather than imposing a particular type of change on students. *Examples:* Basile and Marlow, 2002; Henze and Lob, 2000.

35   (8) *Links with university EMS/SMS:* HEI Environmental Management Systems (EMSs) or Sustainability Management Systems (SMSs[10]) provide important opportunities for students to engage with the practicalities of environmental management. Increasingly, this is becoming a route to ESD (Dawe, Vetter and Martin, 2003). It is also recognised that universities which do not enact EMSs encourage a culture in which students may be inhibited from taking on board ESD. In addition the whole institutional and physical structure of the university will influence students either *away from* or *towards* ESD. *Examples:* Ali Khan and Peters, 1995; Barwise, 1994.

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[10] SMSs are intended to be similar to EMSs but set much higher standards, e.g. 'nil carbon dioxide emissions', rather than merely a commitment to 'incremental improvement' year-on-year. They are still largely hypothetical, but see Burns, 2000, for more.

(3) Holistic Thinking

36   (9) *Interdisciplinarity and Critical Thinking*: This is an important meta-skill: 'students need to be able to think critically about the nature of knowledge, and about the ways in which knowledge is produced and validated'. This ability is crucial because in ESD students will not be able to retreat onto the familiar and safe territory of any discipline they might study. They will have to become confident in inter- and trans-disciplinarity, in assessing processes and solutions which take their elements from many different disciplines, in order to enable 'them to participate in mentoring relationships that will develop their talents and interests' (Bowers, 2003, Jucker, 2002). *Example:* Holland, 2004.

37   (10) *Systems Thinking:* Sterling, 2004, has argued that we need 'a *third* learning level', namely 'transformative learning or epistemic learning'. This refers both to the fact that we need to learn to see things differently, i.e. as whole systems, rather than in a reductionist way, and to the necessity to develop enough reflective distance to understand how the whole system works (Jucker, 2002; Martin, Brannigan and Hall, 2004). *Examples:* Blackmore, 1994; Henze and Lob, 2000.

38   (11) *Respect/Sensitivity for All Subject Areas:* There is a need for the contributions and potential interactions between all subject areas, to be recognised in as positive a way as possible. This is not to be naive about important critiques of particular disciplines. However, the ESD student will need to be able to recognise the contributions of all disciplines, and to be able to draw on them, freely and confidently, and to understand their interactions. *Examples:* Basile and Marlow, 2002; Blackmore, 1994.

The Framework

39   This framework has been used throughout the baseline review process to evaluate teaching and learning approaches in the focus groups and for the identification of emerging good practice models, and to analyse the questionnaires.

40   We accept that there are overlaps between some of the categories identified. However, in order to review the current approaches to teaching and learning in ESD the framework outlined here provides an effective and more easily communicated way of exploring tutor and Subject Centre perspectives.

Results from Subject Centre Questionnaires, Focus Groups and Emerging Good Practice

Introduction

41 The results are presented in the following sections:

- Defining Sustainable Development.
- Delivery of Sustainability: Teaching Methods Employed.
- ESD Teaching Approaches.
- ESD Curricula Orientation.
- Emerging Good Practice.
- Barriers and Solutions to Embedding ESD.
- The Student Experience and ESD.
- Requirements from a Generic ESD Toolkit.

Defining Sustainable Development

42 *Reluctant definers:* Several Subject Centres, especially from the humanities, were reluctant to settle on any particular definition, since they felt it compromised certain important aspects of how they approached the subject. It was felt that the definitions supplied in the questionnaire mainly originated from the environmental and social and political sciences. As such they paid inadequate attention to concepts of 'equity' and 'empowerment' which had long traditions within their own subject areas. Others said that it would be 'unwise to impose a particular definition which served to exclude individual practitioners who may have an important contribution to the debate'. Another Subject Centre commented on the fact that what was behind the language was often of interest. For example, 'sustainable development' and its associated vocabulary could easily hide matters of great diversity behind a single phrase. This was therefore another important question: could definitions be used politically to mask diversity or to stifle debate. As one respondent said: 'the very *use* of these terms can serve to cover up difference and can give an illusion of consensus'. There was certainly a tendency for 'sustainability', as a definition or a term, to 'flatten out contradictions'.

43 It was also evident that for some Subject Centres, this was their first involvement with ESD, and they were therefore unsure of which definition would best suit their disciplinary groupings.

44 *Brundtland Definition:* Some Subject Centres said that they would be generally happy with using the Brundtland definition from 1987, '*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*'. However, even here there was contention surrounding the need to make clear the implications for future generations, of either acting in a 'sustainable' or 'unsustainable' way. One Subject Centre interpreted Brundtland as follows: 'In terms of SD in Higher Education (HE) we understand this to mean 'development of curricula and pedagogy to equip students with the skills and knowledge to live and work sustainably. This recognises the importance of sustainability literacy among students and the growing demand for sustainability skills among employers'.

45   *Utilitarian Perspectives:* Other useful, and rather more utilitarian perspectives were given from some Subject Centres, especially those dealing with physical shaping of landscapes or with industrial processes. Here it was emphasised that definitions could be strong (i.e. recognising absolute capacity constraints) or weak, countenancing utility trade-offs which might occur, and inevitably adopting a looser definition of sustainability. There were also a wide range of 'operational definitions' used by people working in different professional contexts. Here, there was some empathy with the *Five Capitals[11]* model, since this would easily relate to products and processes.

46   *Overlapping Circles:* Two Subject Centres had affinities with the 'overlapping circles' models of either *environment, society and economy*, or, 'earth' and within this, *equipment, equity, empowerment and economy* (Jucker, 2002, p. 33). See the figure below:
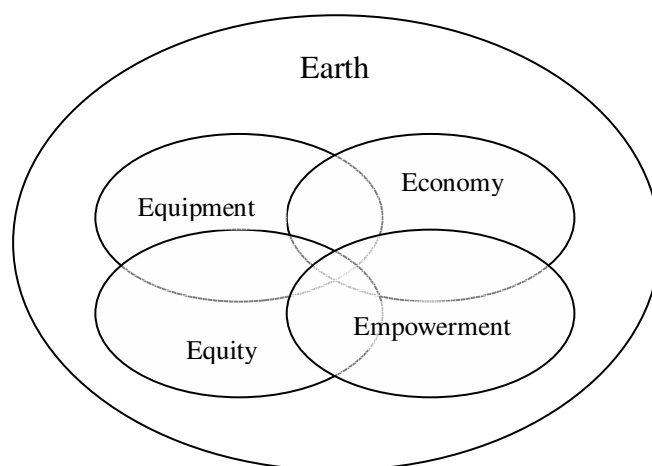
47   Such definitions were used creatively so as to widen out debate among students, and to consider which of the elements was of primary importance. Here students were encouraged to think critically, not so much about the underlying concept of sustainability, but about how it was being used in practice. For example: 'It offers scope for discussion; where are we within the three spheres, where should we be located; it does not presume any equality between the three spheres, but enables the user to locate where they wish'.

48   In conclusion, orientations towards defining sustainability vary widely. Indeed, several respondents mentioned that they would use all of the definitions supplied, within their teaching area, quite deliberately, as a provocative stimulus to involve students in debate.

Delivery of Sustainability: Teaching Methods Employed

49   *Conventional methods:* Most Subject Centres acknowledged that ESD was delivered by conventional methods; lectures, seminars and tutorials. Two identified internet resources as being essential for ESD's delivery.

50   *The personal:* Two Subject Centres mentioned issues around personal perspectives (e.g. tutors as role models) as being of significance, one saying that it would be possible to re-

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[11] A model, devised by Forum for the Future and based on a hierarchy of natural, human, social, manufactured and financial capital (see Appendix 2 p. 63).

orientate the course around personal reflection, the other declaring that tutors might either be *good* or *bad* role-models: and just what were the implications?

51   *Re-connecting to reality:* Regarding 'experiential learning' or 're-connecting to reality' a much wider range of Subject Centres, including (even) some unlikely subject groupings, characterised this type of teaching approach as being axiomatic to successful delivery of ESD. Included within this category were such items as: real-life and real-time interpretation; field trips; environmental audits; the use of role-play; a year abroad; and development of case-studies. Some also mentioned assessing the performance of the HEI, in terms of its environment, or social connections, or the HEI's overall performance in relation to ESD, as having value, although they doubted that a formal connection could be made between this and their disciplinary area.

52   *Holistic thinking:* One Subject Centre described its approach to systems thinking, stating that it explored the 'big' questions about globalisation, political systems and the nature of science.

53   Two Subject Centres admitted that they did not know what teaching techniques were used in delivering ESD, and a third claimed that it was not delivered.

ESD Teaching Approaches

54   The three broad teaching approaches outlined earlier —the *personal, re-connecting to reality* and *holistic thinking*— were subdivided into eleven teaching approaches and are here mapped against the responses from Subject Centre focus groups and the models of emerging good practice (Appendix 8). The two sets of results are presented separately to preserve the transparency of the outputs from both sources.

55   In the case of the Subject Centre focus groups direct quotes have been used wherever possible in order to preserve the authenticity of the debates. Focus groups generally consisted of the Subject Centre manager and several HEI tutors working within the subject areas. Where conversations have been summarised they have been put in square brackets [].

(1) The Personal: Teachers as Role Models

56   *Focus Groups:* The response to this was generally positive. The Engineering Subject Centre and The UK Centre for Materials Education (UKCME) regarded this to be a key competence, even regarding it as something which could be at the heart of a job description. The English Subject Centre was also positive, and viewed an extension into the local environment as being an option. The Maths Stats and OR Network (MSOR) mentioned that applied mathematics could be working in this area. The Geography, Earth and Environmental Science Subject Centre (GEES) stated that 'passion provokes student interest'. Set against this were concerns about promoting particular lifestyles although it was also accepted that HE was 'not value free'. Six of the Subject Centres expressed approval for using the approach, with one stating that it was already used, but not in an ESD context as yet.

57   *Emerging Good Practice:* Here, views varied between the importance of this as a vital 'key competence' for effective teaching, to concerns that it would introduce bias among students. Some, for example, identified the objective assessment of tutors' own environmental performance alongside that of students' as both problematic and, on other occasions, unproblematic. In some areas, it was suggested that the tutors' own environmental performance might not be exemplary but, in fact, this could be beneficial.

However, if, on the other hand, it did prove to be beyond criticism, and environmentally-exemplary, then this, by itself, would set up problems of unduly influencing students as to what conclusion to come to. This brings in the notion of ESD as an ideology which is taken up here in the Discussion section. Many tutors were of the opinion that they should not assume the role of proselytising to students, even those tutors who were 'environmentally friendly' in attitude. Some courses, however, were quite deliberately value-laden, the values, in this particular case, being to convince students of the validity of SD. In conclusion, these apparent contradictions can be resolved somewhat by suggesting that either view has a legitimacy, depending on the course context, and what the course is supposed to be delivering.

(2) The Personal: Teachers as Learners/Learners as Teachers

58   *Focus Groups:* Two Subject Centres, (Information and Computer Sciences (ICS) and MSOR referred to the approach as 'authentic and 'relevant' citing student-led seminars. Engineering and UKCME valued the 'more constructive involvement of students', and English stated the method was already used via their courses. GEES strongly approved of the concept as a way of 'applying knowledge and broadening experience'. Reservations included students' 'mindsets and expectations' and also loss of control.

59   *Emerging Good Practice:* Opinion here was generally favourable, it being widely accepted that tutors at HE level tend to gain intellectually from interaction with students. However, several tutors stated that postgraduate and mature students tended to be far better at 'role play', and collaborative learning approaches —the type of area traditionally enacted within this approach— than typical undergraduates. Care was also needed to ensure that some students were not disadvantaged by such approaches. They could be, under some circumstances: for example, some undergraduates might be more receptive to formal lectures than to participative exercises. One tutor argued that for it to be successful, the tutors would have to possess extraordinary open-mindedness in order not to be drawn into areas of bias when assessing student performance. In the more vocational degree routes, however, this approach was largely agreed to be integral to the degree. Taking the more traditional route of student seminars, most agreed that these would be suitable and advantageous arenas in which to discuss ESD. Some tutors argued that, 'like it or not', collaborative learning was an inherent part of ESD, given the many uncertainties that surround SD as a general concept.

(3) The Personal: Lifelong Learning

60   *Focus Groups:* Views varied considerably. English was already reinforcing ESD via its recruitment of mature students to its courses, ICS and MSOR said ESD could be linked to Continuing Professional Development (CPD). Any CPD should be as discipline-focused as possible to encourage uptake. GEES stated that they were, as were most HE course areas, trying to engender independent lifelong learning via their courses. Objections ranged from a dislike of the terminology used, saying that it sounded like indoctrination, to a realistic view that HE sometimes failed in the noble ambition of creating independent thinkers. Four Subject Centres said they would use it, with three being undecided.

61   *Emerging Good Practice:* Most people argued here that the whole object of HE was to achieve a change in outlook for the student. Therefore, why was reinforcement necessary? Others were more sanguine, stating that there was no guarantee that, once students had learnt about SD, they would continue the ethos beyond HE education.

Some mentioned the fact that many of their students inevitably went on to do further qualifications, ending up in environmentally benign, or even beneficial professions. This, in itself constituted 'lifelong learning'. Some described this area as a devolved responsibility, with professional institutions having an important role in asserting ESD via Continuing Professional Development (CPD) of students throughout their lives. In some course areas, public lectures, involving guest speakers, were already held in order to gain public interest in SD, and this formed a commitment to public interaction, and by implication, lifelong learning. Recruitment of mature students, and their interaction with SMEs, and NGOs was mentioned as another factor. In other words, the more experiential the degree, the less likely the need for lifelong learning, and the more likely the student was to develop and practice SD throughout their personal and professional lives.

(4) Re-connecting to Reality: Local Communities

62 *Focus Groups:* People were generally in favour of student and tutor involvement within local communities, and, for example, GEES related it to 'thinking globally, acting locally'. ICS and MSOR said that, by implication, it should keep students within the region. English, despite enthusiasm for the approach, said that it was not easy to see how a 'subject of the head' could easily connect with local NGOs or SMEs. The Languages, Linguistics and Area Studies (LLAS) Subject Centre emphasised it was a real 'vitality-sending' concept. Set against this were challenges of administration, finance and support for the process.

63 *Emerging Good Practice:* In many disciplinary areas, tutors gave a strong emphasis to connections, including student work placement, with, for example, SMEs, NGOs, action groups, schools, etc. Some had not considered making this connection before, some had, but could not clearly visualise how it could be done within their own discipline. Others stressed the significance of the institution taking a lead on SD and, indeed, enacting its Corporate Social Responsibility[13] (CSR), in order to provide legitimate motivation for tutors to establish better community-student relationships. A number of ESD courses were supported by Regional Development Agencies (RDAs) so it was axiomatic that they had to be involved with local businesses. Some stressed the practical difficulties of such involvement, if, for example, their course was too short. A few mentioned subject areas which were too esoteric, or abstract (e.g. Philosophy, English, when delivered in some areas), ever to support such engagement, though they were clearly committed to aspects of ESD. There was general support for the view that by being involved with the locality, students can actually see the realities of what they are being taught about.

(5) Re-connecting to Reality: Real-life experiences

64 *Focus Groups:* Several Subject Centres gave examples of the potential for integrating this approach to teaching: ICS and MSOR mentioned examples within applied mathematics, such as home heating optimisation, and LLAS, the 'year abroad'. In the latter case, students were often involved in experiencing environmental issues or controversies, in unfamiliar settings, and giving accounts of them. English, despite a general view opposed to students using their personal experiences, this being equated to subjectivity, there was still some potential. This might particularly be the case within eco-criticism: here 'real-life experiences' might be compared to existing nature, and to books giving accounts of nature in particular regions. Challenges in this general approach included, for example, financing the administration of field courses and placements.

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[13] Corporate Social Responsibility consists of evaluating an organisation's social impact from an ethical standpoint, and, then taking steps to minimise its negative social impacts. It may or may not include environmental considerations

There was also a tendency for things learnt during contact with reality, 'to date'. LLAS identified the fact that a student's bad experiences could help reinforce stereotypes, rather than open up a student's learning experience.

65   *Emerging Good Practice:* A number of courses were, it was claimed, already, necessarily involved in the 'messy realities' of real life. Some subjects were, it was claimed, unafraid of 'exposing their dirty linen' in public, and being criticised. In this way, they were engaging with real-life. However, in other contexts, student work based on their own experiences of reality would be equated with encouraging 'self-indulgent subjectivity' and would be frowned upon. Nevertheless real-life was, this particular tutor concluded, worthy of consideration, and there were examples within the course area where students had contact with nature. In one ESD course, there was an especially strong emphasis placed on respecting what the students' individual backgrounds were, and what they could bring to the subject area: this was dealing, subtly and carefully, with the students' own reality, and taking account of where particular individuals were starting from, in terms of the ESD curriculum. There were other examples of where student placements with businesses had actually led them to help the businesses to re-orientate themselves with respect to SD.

(6) Re-connecting to Reality: Connecting with People and Nature

66   *Focus Groups:* Field trips, during which students made direct contact with nature, were a common experience for both English and GEES. English emphasised that they aim to make the student understand from where their values and appreciation of nature derived. ICS interpreted engagement with nature as the use of information technology systems to help reduce the consumption of raw resources and waste, e.g. via the use of digital technologies versus paper. Engineering and UKCME also equated nature with process efficiency[12]. ICS, MSOR, Engineering and UKCME were also self-critical in identifying the fact that either there were few, or limited opportunities existing for group work specifically within the discipline (MSOR), or that social and global aspects of the subject had traditionally been dealt with poorly in their areas. GEES strongly approved of using this teaching technique, ICS and MSOR stated that they would use the approach, and a further Centre said they would consider trying it (LLAS), Engineering and UKCME being unsure. GEES also asked the key question: 'whose nature and by whom defined?'

67   *Emerging Good Practice:* There were examples given of students constructing nature areas on campus, experiencing nature in a wide variety of field-settings. Some tutors stated that their view was that human beings were only one species among many, and it was this ethos they aimed to instil in their students: in other words, to have a sense of humility, and to appreciate their equivalence to other species. However, becoming emotive about such views could make students less receptive. In some disciplinary areas, students' contacts and relationships with their pets were used as a way in to teach about this ethic. Results were sometimes contradictory, with certain students readily relating to nature as equivalent – on the same basis as - human beings to keep parenthesis the same at each end of the clause whilst others rejected this view and described them as something apart. There were significant interests here, in students' perceptions, and the intellectual framing they used, in relation to animals and plants. For some people, the entire way the HEI orientated itself around nature, in terms of its adoption or non-adoption of an EMS, was the essential test of the relationship with nature: did it, in fact, 'practise what was preached' within the ESD elements of its courses? A few tutors interpreted this approach as to do with the consideration they gave

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[12] For example, the efficient use of energy in the manufacturing process.

for physical materials used within ESD courses. Some had taken great care in sourcing them from relatively benign natural sources, or using only post-consumer waste.

(7) Re-connecting to reality: Enacting Social Change

68   *Focus Groups:* The Engineering Subject Centre emphasised that they were about dealing with change, hence fully endorsed this approach to teaching. Underlying this was the fact that it was easy to believe in 'free thinking' but possibly this was problematic in itself. The English Subject Centre stated that 'aiming for change in attitudes towards the environment is just as legitimate [as Marxist or feminist approaches]'. With GEES, many agreed that social change as a student outcome was needed. However, two problems were identified: the first was that student disillusionment on meeting 'real world' constraints and the enormity of environmental problems could be considerable; the second identified the perception that 'pushing a view' was incompatible with scientific training: a more appropriate, less controversial phrasing might be 'capacity for empowerment', rather than aiming for 'enacting social change'. ICS, MSOR and English were in favour of using the approach, with English stating that aiming for change, or imparting a particular value system, was integral to English as a subject area. In other Subject Centres views were somewhat divided over whether or not to use this approach.

69   *Emerging Good Practice:* This proved quite contentious, and, in this respect was rather similar in approach to *Teachers as Role Models*. Many tutors did not think it appropriate to aim to create 'student activists'. The background to this was, especially with many undergraduates, that they had come to HEIs comparatively unaware of their own views. It was up to the HEI to permit, encourage even, their development of multiple perspectives on particular problems and challenges. It was not up to the HEI to drive them down one particular route. There were dangers of indoctrination here. However, other tutors, by way of complete contrast, clearly approved of this stance, and advocated it, looking at the challenge in some detail: For example, the potential challenge of the combination of (student) apathy combined with the magnitude of the world's environmental problems would militate against them becoming activists. A minority of students would always make the connection but a few tutors wondered about whether students could be turned into activists, or whether direct family or political experience might have more influence. Other findings were that, at some HEIs, it had actually been shown that environmental awareness had gone *down* among students during the three years they had spent doing an undergraduate degree. One or two tutors stated that enacting *behavioural* change among the students would not be enough: it had to be *societal* change that was aimed for. Several tutors said that this aim was inherent within their ESD courses. In a business context, students were placed, e.g. within SMEs, precisely to be *activists* to change the business orientation towards SD.

In conclusion, this approach would, in general, seem to be less contentious and more acceptable on postgraduate degrees, and less acceptable or appropriate on undergraduate courses.

(8) Links with Institutional Environmental Management Systems (EMSs)

70   *Focus Groups:* Engineering UKCME identified the presence of an EMS as being a 'vital need' in order for ESD to be successfully integrated around the HEI's teaching practice. ICS and MSOR again, seemed to identify the potential role of an EMS, as being integral to success for ESD. However, some Subject Centres thought that connecting with such a system, as used by the individual HEI, was dealing with something 'outside of the subject area': In other words, they could be regarded as not thinking 'holistically' with regard to SD. Various challenges were identified: probably the main one, running across several Subject Centre heads, was that of integrating what were perceived as utilitarian aspects

of an EMS with subject areas which were centred around more abstract or theoretical areas ('subjects of the head'). It was not the case that the Centres were not keen or motivated, but rather, that they could not yet find a way forward with such a teaching approach. However, some Subject Centres also expressed reservations about what an EMS could actually achieve in practice. Some members of GEES indicated that it supports 'weaselism', e.g. 'we are doing it' so people within their disciplinary areas would feel that they would not need to bother.ICS and MSOR) would go with the approach, but emphasised its broader nature. English and GEES said that they were also receptive, but that actually connecting with operational EMSs would be a 'hard slog'.

71 *Emerging Good Practice:* Many thought that this was an essential approach, that HEIs should be a resource to learn from. Unless there were links between the curriculum area the whole institution's approach to sustainable development, then ESD would be largely ineffective. This is because it would be contradicted by students' daily experience within the institution. Several tutors described the sustainability management groups they had in place and how important it was to secure student representation on such groups. Student motivation around ESD had been made much stronger simply by being in buildings which were designed to have minimal environmental impact. If the HEI had adopted an EMS students had been motivated to become involved in recycling and energy issues. Some tutors said how they may have been (personally) rather complacent about how students actually experience the institution. What, for example, had been their experience of halls of residence, and what impact this would have on students' receptivity to ESD? Some tutors had not even thought about the relevance of an Environmental Management Systems (EMS). Others thought that the inherently utilitarian nature, at least of EMS, presented challenges, at least in some areas, because it contrasted markedly with the nature of some disciplinary areas: e.g. 'subjects of the head'. Nonetheless, such tutors were still often receptive to attempting to make connections, and viewed the issue as an interesting problem which needed addressing. Some tutors were in HEIs or faculties/schools with EMS or had encouraged EMS implementation within their area, because it met with the 'practice what you preach' nature of their particular ESD course.

(9) Interdisciplinarity and critical thinking

72 *Focus Groups:* Most of the Subject Centres strongly supported this approach. ICS stated that these concepts were at the heart of their disciplines and within English this was seen as a defining feature. However, there were challenges because introducing approaches to critical thinking involves thinking about complex systems, and students could not always understand what was being asked of them. In addition, helping students adopt an interdisciplinary approach was not always easy. It was argued that HEIs had not been supportive of interdisciplinary programmes and had tended to close them down in the past. This, in turn, tended to discourage students. Also, 'discrete forms of expertise' tended to 'militate against it'. The Economics Network area perceived barriers operating as follows: the institutional structure of funding, the physical distance between departments, the lack of 'knowledge' of 'how to speak' to other disciplines, and the sense that the subject area has traditionally been self-contained.

73 *Emerging Good Practice:* Many tutors argued that critical thinking was an important skill demanded by employers but it was something that was not easy to teach. However, several subjects have developed teaching and learning approaches to support such ways of thinking. Others said that it was a skill demanded for 'high level' employees. 'Thinking wide' forms an important aim of several courses, especially to build bridges between the arts and the sciences. Some went further, declaring that their disciplinary area was actually defined by these concepts of interdisciplinary and critical thinking, sometimes at advanced level. Other courses were inherently interdisciplinary, by the very nature of how they trained students. Some tutors said that within their own HEI, the reality was that

such interdisciplinarity as existed was there by historical accident, rather than by design. The reality of this would inform students, at least to some extent. In some subject areas, there had been recent historical moves towards 'holism' and away from past dualisms. One commentator said that it would be interesting to contrast critical thinking and systems thinking: often they are opposed, and furthermore, it was argued, the Western tradition of critical thinking is reductionist rather than synthetic and holistic.

(10) Systems thinking

74   *Focus Groups:* ICS, MSOR and Engineering said that this was a key skill within their areas. However, they also cautioned that the 'systems' they dealt with were not necessarily those of biological ecosystems, or of social systems. For example, some commentators within Engineering stated that their systems excluded reference to cultural aspects. In a similar way, but from a different standpoint, the English Subject Centre identified the fact that students using Marxist or feminist critiques would always connect with politics, thus demonstrating some awareness of social 'systems'. They might, however, be naive about connecting with biological systems, and make connections less easily. The challenges around systems thinking was that, to some, the term itself sounded mechanistic and utilitarian, whilst to others, they anticipated problems when moving out of the 'comfort zone' of their own discipline.

75   *Emerging Good Practice:* There was good support for this approach, in most subject areas. It was stated by some as being more appropriate at postgraduate level, the argument being that students only start making links once they are well advanced in their discipline. For example, at undergraduate level a 'broad-brush' systems approach might produce little meaningful analysis. In some disciplinary areas it was also argued that it would be difficult for students to connect with biological systems: instead, they would connect more readily with the political. There was also some commentary from the humanities discipline that the term itself was mechanistic. However, most people approved of the need for people to see connections, via systems thinking. Some stated that systems thinking was an inherent part of analyses they were already doing by assessing their own personal sustainability performance, others, that it was introduced, within their subject area, by communication and interaction with stakeholders.

(11) Respect/Sensitivity for all subject areas

76   *Focus Groups:* ICS and MSOR said that this was central to their disciplines, being an essential skill for employment. English argued that their subject, more than many others, had a 'soft sense of its own boundaries. It connects with all sorts of other subjects'. GEES stated that this was a useful focus for sustainable development. Ideally practitioners needed to work at the 'boundaries of disciplines'. Among challenges identified was the need for HEIs to embrace more fully interdisciplinarity, in order to encourage student empathy with other disciplines as naturally as possible. English said that 'Perhaps what is needed is respect for a subject's autonomy'. ICS said that many students still had difficulty relating social areas to their core subject.

77   *Emerging Good Practice:* Some subject specialists argued that this was an inherent part of the earlier approach *(9) interdisciplinary and critical thinking.* Most commentators were agreed that it was a useful approach, but one that required a certain humility, and an ability to listen to other people and to keep an open mind. Some said that it was sometimes difficult to own up to ones' own ignorance. Some subject areas had always been self-contained, and despite changing and new perspectives, it was not always easy to break out of this mould. A few tutors argued that their subject areas had a 'soft sense' of their own boundaries, allowing them almost to move between other subject areas relatively effortlessly. There was some agreement, however, that it was important not to

be uncritical of all disciplinary areas. One tutor stated that it was best to maintain *contention* between different disciplinary areas, as a way to get students thinking in more depth about their own views. Many tutors, however, equated respect for all subject areas as a necessary skill in order for students to enact interdisciplinarity successfully.

ESD Curricula' Content

78   The curricula' content and connections with sustainability of Subject Centres were examined. These are summarised below:

- *Engineering and Materials Education:* With the subjects' basis in dealing with the realities of industrial processes, and in the built landscape, there are very firm connections evident with engineering professional bodies concerned with progressing ESD. It is evident that almost all of the subject groupings within this heading are now dealing with the implementation of ESD, to a greater or lesser extent.
- *English:* English is concerned with 'representations' (in this case of the natural world) on the basis that representation and available language influence thought and perception. There is a strong tradition of 'eco-literacy'. This concept involves comparing literature (both fiction and non-fiction) with environmental realities, in a critical way. The disciplinary area is also well-used to progressing particular value systems (e.g. Marxist, feminist). While the area is academically advanced, it is, as yet, represented within unfortunately few HEIs within the UK.
- *Geography, Earth and Environmental Sciences):* Home to environmental science, this Subject Centre is at the core of attempts to implement ESD throughout HEIs.

79   There are also Subject Centres keen to progress ESD, but who have not, as yet, found ready or easy connections into the subject. These include:
- *Information and Computer Sciences and Mathematics, Statistics, and Operational Research.*
- *Languages, Linguistics, and Area Studies.*
- *Performing Arts (PALATINE.)*
- *Psychology.*
- *Art, Design and Media.*

80   There are other Subject Centres which can be regarded as being of intermediate status, with a *very high potential*, and a great enthusiasm for enacting ESD across almost all of their subject groupings, but with little evidence of movement as yet. These are:
- *Bioscience.*
- *Economics.*
- *History Classics and Archaeology.*
- *Hospitality, Leisure, Sport and Tourism.*
- *Sociology, Anthropology and Politics (C-SAP.)*
- *Philosophical and Religious Studies (PRS).*

81   *Subject Centre Focus Groups:* These varied tremendously, in their approach to SD. Some emphasised interdisciplinarity, others technological issues surrounding SD, and still others ethical and philosophical perspectives. Sometimes approaches were utilitarian, and focused on process efficiency, whilst in others, a much more ethical or philosophical approach was adopted. In other areas a more open agenda was pursued, allowing the students to determine the course orientation.

82   The literature search revealed 27 components that have been used by sustainability practitioners, for example climate change, Index of Sustainable Economic Welfare (ISEW), 'visioning' and 'backcasting'[13]. The Focus Groups and Emerging Good Practice participants were asked which of these they used. Illustrative results, from four different subject areas are presented in Appendix 3. The analysis presents a more fine-grained representation of the approaches reported on above: Engineering was concerned with efficiency of production, English and Philosophical and Religious Studies dealt more with moral and ethical issues, having strong anthropological and cultural components, and GEES dealt with the 'big' sustainability issues such as climate change and biodiversity but with little concentration on moral/ethical issues.

83   A number of new content areas within ESD were suggested by the Subject Centres, namely:
- 'Holistic' approaches towards projects/initiatives.
- Consumption and production.
- Consideration of consumerist versus environmentalist systems of belief and representation.
- Pleasure/pain.
- Emotional reaction to environmental threats.
- Love of particular places, landscapes, animals, etc.
- Problem of claiming anything to be 'objectively real' as against cultural relativism and constructionism.
- A training in evolutionary theory (Darwinism etc.), and ecosystemic change and its implications for such factors as intergenerational equity.

These came mainly from humanities' perspectives, with a contribution from engineering.

Emerging Good Practice

84   Examples were mostly referrals from Subject Centres and conform to two characteristics:
(1) Firstly they were extending the boundaries of their subjects to include other disciplines; and
(2) Secondly they were connecting very closely with their own institutions' environmental practices in their courses. Two examples are given below, and another six are included in Appendix 8.

Vignette[14]*:* **Embedding Education for Global Citizenship and Sustainable Development (EGCSD) in Initial Teacher Education and Training Courses**

Course outline: This is a sustainability and development orientated teacher training course. The core areas of the course are interdependence and diversity, global and local dependencies, and values and perceptions. It was developed, *not* as a modular solution, but as a replicable cross-disciplinary course. Establishment of the course was carried out in

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[13] Note: this term was developed from Holmberg and Robért, 2000; Mulder and Biesiot, 1998; and Roorda, 2001 and refers to a system for groups making predictions about the future of their organisations (HEIs, NGOs, SMEs, etc.), then 'backcasting' to the present to work out the steps necessary to move between the present and future. The English perspective on this is valuable.
[14] These vignettes are short characterisations of courses, based on interviews with course directors. They were asked to respond to the framework of 11 teaching approaches, and 27 content or connections with SD. The most significant features of the responses are recorded here, and results generally appear as responses to listings. However, in some cases tutors chose to provide spontaneous commentary, in place or the 11 or 27 approaches/connections

parallel with research at Glasgow, the Ulster and Gloucestershire Universities. The particular emphasis provided by the University of Wales, Bangor was on cross-disciplinarity.

Teaching approaches: The personal role-model is very important. However, this tutor is for students making up their own minds about which role model to follow. Teacher training is dealing very much with 'messy realities'. One technique used to connect people with nature, and consider their perceptions involves students being blindfolded and feeling/sensing nature (e.g. trees, plants, etc.), only to then remove their blindfolds and reconnect with nature in quite a dramatic manner. Regarding activism, this tutor does not think we should be trying to turn students into activists, but we must get them to consider multiple perspectives and come to their own conclusions. In this context, it is important to remember, they come to us when they have, in effect, not even been given the chance to even think about issues. Environmental Management Systems (EMSs) are key in the sense that the institution has to be seen to be acting sustainably, e.g. the University of Wales, Bangor has a sustainability policy, and an active group managing it: significantly, the latter must include student representation. The whole project has been designed around cross-curricula input and it was never planned as a module: it was intended to integrate with all subjects: in conclusion, any opportunity to 'think wide' is valuable.

Content/connections: In sustainable development it is important not to miss the global aspects. In this course area, the 'global' is highlighted almost more than the sustainable development aspect. In England, it is notable that these two approaches are often separated. There are very strong connections with: biodiversity; climate change; integration of social, economic and environmental factors; bioregionalism and local stakeholder involvement; globalisation and localisation, including global inequality and North-South trade; historical investigations of adoptions and origins of sustainability policy nationally and internationally; sustainable tourism versus unsustainable; and finally, urban and/or/versus rural sustainability.

Course Director: Sheila Bennell.
HEI: University of Wales, Bangor
Faculty/School: Collaboration between the World Education Centre and the School of Education
Internet: www.bangor.ac.uk/addysgbyd

Vignette: **Representations of Spirit, Body and Beast**
[One-year course within BA Joint Honours Theology/Religion]

Course outline: The course is centred on concepts around the mind, spirituality and the soul, and therefore it is inherently a non-experiential type of approach. The tutors do not try to instil sustainability values in the students (in fact the word 'sustainability' is not used within the course), but aim to get them reflecting intelligently on the issues and their effects in society. Students will have critically examined some areas of significant theological and contemporary anthropological interest. They will have gained insight into the influence of Christianity on ways in which human beings have been defined and understood. In addition, they will have reflected on some of the ways in which traditional religious views have been challenged within a contemporary context. Students will have engaged critically with some key issues and thinkers and will have investigated a range of representations of human beings, making connections between different media and disciplines. Students' critical and analytical skills will have been developed through discussion, and through analysis of ideas, primary and secondary texts and other media, through coursework and through participation in seminars.

Teaching approaches: There has to be no suspicion of 'leading students up the garden path', so the tutors would be a little dubious about using the tutor as a role model. With regard to local communities, this is not such a key issue in theology, although some students

are involved in action groups. Connections with nature are made by looking at students' personal experience of, for example, their pets. Here, for example, opinions differ markedly, with some students empathising with pets as being very similar to human beings, and others wishing to place them in a quite separate category, as 'other animals'. These perceptions provide a useful introduction into the ways in which nature is perceived, especially from religious or theological perspectives. Regarding 'holistic thinking' there has been a general shift towards holism in theology and this approach both reflects sustainability's ethos and is contrasted with past dualisms.

Content/connections: Ethics and relationships with the environment, and environmental representation, within the Western religious context, are currently a core concern within both theology and this course. The course is valuable in that it explores personal and collective stances, in relation to environmental destruction or preservation, and the prevailing religious ethic. Key to the course is that it is grounded and reflected in the practical activities and outlooks of students, whether these be, for example, Christian, pagan or New Age. There is a strong emphasis on the history of conceptual attitudes to nature and ideas of progress, and critical discussions around these topics. There is also a concentration on biodiversity, and on integration between economics, society and environment, plus also religion, philosophy and history, plus some emphasis on systems thinking; and globalisation/North-South trade, where some students see the connections very clearly, and others do not. Finally there is some connection between urban and/or/ versus rural sustainability. With many aspects of sustainability, there can be a strong or weak emphasis depending on whether students get stimulated to engage in debate around the issues. This is because of the discussion-based learning orientation adopted, where the course is not overly prescriptive and debate is encouraged, together with appropriate educational benefits.

Course Director: Sally and Mike Alsford
HEI: University of Greenwich
Faculty/School: School of Humanities: Department of Sociology, Criminology and Cultural Studies
Internet: www.gre.ac.uk/courses/post/sch/hum/

Barriers and Solutions to Embedding ESD

Barriers

85   Barriers to the successful embedding of ESD recorded from the Subject Centre Questionnaire returns were as follows:

- Curriculum too crowded already and lack of time to update courses.
- Perceived irrelevance by staff (and) awkward fit with subject area.
- Lack of staff expertise and the need to acquire new knowledge.
- Lack of institutional drive and commitment.
- Lack of staff awareness.

86   These results were added to, and reinforced by, discussions with several Focus Groups and a few anonymous interviewees. They appear to bear out earlier conclusions in relation to embedding ESD (Dawe, Gant and Taylor, 2003; Jucker, 2002) (Appendix 9).

87   It is difficult to evaluate whether any are specific to ESD. Other Subject Centre experience appears to suggest that many of the barriers are similar when suggesting the inclusion of other (non-ESD) material. One factor may be the apparent difficulty in incorporating ESD into unlikely areas and implies that discussion is needed in this area.

For example, Table 1 below shows how the numbers of barriers decrease, with an apparently closer relationship to ESD of the Subject Area.

88   Table 1. Numbers of barriers as perceived by Subject Centres*

Subject Centre	Numbers of Barriers	Commentary
Economics	11	Perceived irrelevance by staff, and lack of staff awareness/expertise, need to acquire new knowledge, lack of time to update courses, lack of relevant course examples, lack of academic rigour/misunderstanding, internal accreditation, validation systems, benchmarks, lack of institutional drive and commitment, perceived irrelevance by students and lack of market for students (i.e. lack of student demand), financial restrictions, in that it inhibits interdisciplinary work. Finally, confusion over what needs to be taught.
Performing Arts (PALATINE)	10	Awkward fit with subject area and lack of staff expertise; perceived irrelevance by staff and students plus lack of staff awareness and expertise, and need to acquire new knowledge; curriculum too crowded; internal validation and accreditation procedures; financial restrictions and confusion over what has to be taught, and lack of institutional drive and commitment.
English	9	Difficulty of translating ecological concepts into literary theoretical concepts was emphasised, followed by perceived irrelevance by staff, curriculum too crowded already; lack of staff awareness and expertise and need to acquire new knowledge; perceived irrelevance by students plus inability to grasp the issues (specifically, scientific literacy); confusion over what needs to be taught; and lack of institutional drive and commitment.
Languages, Linguistics and Area Studies (LLAS)	9	'Discourse within which the debate is framed' was a main factor. Otherwise, broadly similar to the above, plus awkward fit with subject area, and lack of relevant course examples (e.g. inability of students to grasp issues and lack of institutional commitment were not thought to be relevant factors).
Engineering	7	Curriculum too crowded already and lack of time to update courses; lack of staff expertise and need to acquire new knowledge; lack of staff awareness; confusion over what needs to be taught; lack of relevant course examples sometimes an issue; lack of academic rigour and misunderstanding; lack of institutional drive and commitment.
Philosophical and Religious Studies (PRS)	7	Curriculum too crowded already and lack of time to update courses; perceived irrelevance by staff (including lack of awareness), and students also; awkward fit with subject area; hence lack of staff expertise and need to acquire new knowledge; curriculum too crowded already and lack of time to update courses; financial restrictions.

Hospitality, Leisure, Sport and Tourism	5	Perceived irrelevance and partly awkward fit with subject area, by staff and students, especially in sport; curriculum too crowded and lack of time to update courses; lack of staff awareness and expertise and consequent need to acquire new knowledge.
Sociology, Anthropology and Politics (C-SAP)	5	Perceived irrelevance by staff (the 'squeeze' on social science provision was a factor here); internal validation and accreditation systems was, to some extent, a problem; uneven distribution of institutional commitments; financial restrictions; and possible confusion over what needed to be taught.
Geography, Earth and Environmental Sciences (GEES)	3	Curriculum too crowded already and lack of time to update courses; lack of institutional drive and commitment; and financial restrictions.
Built Environment (CEBE)	0	No barriers perceived

*From Subject Centre questionnaire returns, which listed 17 barriers; some defined in the returns were new. See Appendix 9 for example listings.

Solutions

89 Solutions, as determined by the Subject Centre focus groups, were as follows (Appendix 9 for full results):

- **Institutional:** A business case, including marketing information, needs to be provided to Vice-Chancellors to convince them of the case for ESD; this would, in turn, help to change the cultures of HEIs, making them more sympathetic to ESD. The importance and relevance of sustainability as a subject of the future needs to be emphasised repeatedly.

- **Delivery of ESD:** Sustainability should be integral to subject areas and not 'bolt on'; materials need to be provided which are fully contextualised and made relevant to subject areas, to aid this transformation. These quality teaching materials should include case-study material. The modular system must be made to work and collaboration between schools should be encouraged. Issues discussed included the removal of some materials from existing curricula and substitution by ESD materials, or the possibility of providing some material tailored to particular subject groupings which could be used freely by all. In addition, changing the Research Assessment Exercise and Quality Assurance Agency procedures, to recognise fully the significance of SD as an important topic in its own right, is another important recommendation. Others approved working programmes with professional bodies over the more thorough adoption of ESD, as a way of moving this forward. Finally, tutors should be informed about sustainability courses already existing elsewhere.

- **Role of students:** ESD needs to be made relevant to the student body, as another means of making it more likely to be adopted. Students needed to be made aware of their power regarding whether or not ESD was adopted.

- **Role of academic tutors:** Tutors need to be 'enabled', to properly enact ESD, via being supplied with materials, knowledge, and awareness. It may be appropriate to change the roles of staff, and re-distribute them, year on year, as a means of stimulating closer involvement in ESD. Staff development is a significant issue, and it can be better fostered by Continuing Professional Development (CPD), seminars and other administrative support. This support, in turn, links very closely to convincing the higher levels of the HEI of the validity and importance of ESD.

The Student Experience and ESD

90   Subject Centres responded by saying that ESD could contribute to the student experience in the following ways:

1. By developing advanced skills for employment.
2. ESD fosters awareness of different cultures and lifestyles, and the global community.
3. It enables students to understand about difficult trade-offs made in the real world, and informs them about pressing contemporary issues.
4. It enables the development of a more rounded student, informed about ethics, philosophy, entrepreneurial skills, science, humanities and the environment. It gives them a coherent framework for considering this, for the rest of their lives.

91   The following knowledge, skills and attitudes were identified as factors developed by students through ESD courses:

- Interdisciplinary skills.
- Ethical skills and the understanding necessary to put sustainability into practice.
- Critical and reflective thinking.
- Knowledge of the practical impacts that their decisions will have.
- Awareness of the facts surrounding sustainability challenges, and the skills necessary to play a part in their solution.

92   Most Subject Centres were not aware of potential relationships between students undertaking ESD work and their employment prospects. However, in some disciplinary areas, there were already clear links established between SD-aware employers and ESD. In the case of some Subject Centres, it was apparent that the issue had not even been considered until the current research. A somewhat similar story emerged with student-led demand for ESD, in terms of both awareness of the issue, and the research needing to be done. Some Subject Centres expected demand for ESD to increase, as an effect of secondary education now including ESD issues, others said that to keep in touch with modern, contemporary issues, ESD needed to be incorporated into their subject area. In the case of student orientation towards ESD, some responded by saying that students were passionate about engagement with ESD and 'wanted to challenge existing knowledges'. However, there was general agreement that the market research had simply *not* been done, on whether there was either existing or latent demand for ESD within HE.

93   Finally, students needed to be made aware of their potential power in influencing the ESD debate, and whether or not ESD was adopted within particular HEIs or course areas.

Requirements from a Generic ESD Toolkit

94   Requirements as defined by the Subject Centre survey and incorporated into this report are given below.

- There needs to be more emphasis on non-scientific interpretations of sustainability, the philosophical, ethical, moral and emotional are as important as the scientific in teaching.
- Encouragement of interdisciplinary collaboration, via case-studies, and explanation of the pressures and influences on the disciplines.
- Specific to subject definitions of SD and ESD.

- Glossary of ESD terms.
- Explanation of forces acting against implementing sustainability.
- Position statements or discussion points from (named) authorities on contentious issues and on the sustainability debate.
- Background on scientific and social scientific aspects of debate – to be able to provide students with a broader perspective; history of environment/development issues – how and why have they become important?
- Learning resources to cultivate a sense of personal involvement among both tutors and students (e.g. how to estimate Ecological Footprint[15], undertaking a 'bioregionalism questionnaire'[16].
- The material should be copyright-free.

95 Several Subject Centres declared that a 'generic toolkit' applicable across all disciplinary areas would be an impossibility.

Discussion

ESD and the Institution: Realities and Ideologies

96 The culture of higher educational institutions (HEIs) is fundamental to the successful cultivation or practice of ESD. 'how to make sustainability operational has really become *the* starting point question' (Simon 2002), and indeed, it is the most important question dealt with in this report, at least in terms of curricula. What is meant by this? Here are some examples: Does the institution have an Environmental Management System (EMS) in place, or better still, is it attempting to develop a Sustainability Management System (SMS)? Is it aware of the subtle influences its physical environment may have on receptivity to ESD by students and tutors alike? Does it track its resource use with critical regard to its environmental impacts? With students, does it monitor the career patterns of alumni, and their impact on the environment? More controversially, does it do the same with its own staff? Are environmental relationships with the local or regional community appraised in any way, shape or form? Are students engaged with the same: do they go out of the class, and into the field, regularly? Are they involved in debates, citizens' juries, or other fora, for empowering people in environmental decision-taking? Does the senior university management make *positive* statements about the university's relationship with its (biological, or ecological) environment, the *premier* concern of sustainability (Jucker, 2002), or is it indifferent or even conservative in attitude? Finally, how are research collaborations sought? For example, does the HEI seek private-sector funders already sympathetic to sustainability, or is it instead still cultivating environmentally inefficient and unsound companies?[17]

97 Summing up the situation in which HE students learn, Haigh, (2005), says: 'Students absorb many implicit attitudes from their HEIs, which may include their approach to the world. These views are learnt by example – what is done as much as what is said. No doubt, universities like to conceive themselves as the leaders of society and social change. In fact, they function rather more as its followers or perhaps mythos.' This reinforces previous commentary about the *shadow curricula* of institutions (Jucker, 2002), in which sometimes HEIs have been viewed more as perpetrators of destruction than as proper educators (e.g. Orr, cited by Jucker, 2002; Sterling, 2003). Jucker (2002, pp. 213-

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[15] The Ecological Footprint (EF) is defined as the area of land required both to supply a human or institutional population with their needs for living and to assimilate their wastes.
[16] Bioregionalism promotes understanding of the individual's relationship to their bio-cultural locale.
[17] We are aware of course that research falls within the Higher Education Funding Council for England's (HEFCE's) remit, rather than that of The Higher Education Academy. Nevertheless the question needs asking

230) has shown how in all too many instances, the prevailing industrial and social culture, or the 'Dominant Social Paradigm' (Fien, 2004) has militated against the inclusion of sustainability or ESD considerations within HEIs. More recently, further confirmatory evidence of this trend has emerged, at least for the US (Washburn, 2005).

98   Potentially, the Quality Assurance Agency for Higher Education (QAA) Benchmarking statements for particular degree subjects[18] could offer drivers for inclusion of sustainability within some subject areas. They certainly provide useful commentary on disciplines' coverage and curriculum. Approximately a dozen subjects have specific requirements to include sustainability at present. However, we leave this as an 'open question'. Our assumption, rightly or wrongly, is that the 'Dominant Social Paradigm', together with other factors such as the *shadow curriculum* is more likely to influence whether or not tutors make active attempts to include ESD within their course areas.

99   Commentators have, however, quite rightly viewed SD and ESD is an 'ideology', and attempts by HEFCE to introduce ESD within curricula have therefore been equated to being 'shameful' and even 'dangerous' (Knight, 2005). However, *all education* consists of ideologies, some of them less visible or obvious than others. Therefore, what are the consequences of avoiding the *ideology* of ESD (Knight, 2005)? Plainly, one of them is —almost invisibly from the students' point of view— assenting to *'existing trends and entailments'* (Partridge, 2001)[19]. Such trends and entailments may eventually include the end of the world, or what has been described, somewhat less melodramatically, as 'social and ecological destruction in the first class' (Kaivo-oja, 2002). Decisions on *whether or not* to include ESD within curricula are, therefore, potentially very serious.

Encouraging Diverse Approaches to ESD

100   The findings in the results section will have given comfort and support to ESD practitioners coming from a variety of different orientations in their teaching. One of the most significant findings is that there are many, varied, teaching approaches to ESD all of which have a validity of their own, depending on which teaching tradition the tutor comes from, what her/his standpoint on ESD is, and what beliefs she/he has about ESD.

101   How can this 'all too simple', and possibly evasive conclusion, as it might appear to some, be reached? How can these apparently plural and sometimes contradictory results best inform future developments in embedding ESD into the HE curriculum? There are six perspectives here, which we believe, offer especially useful insights:

(1) The results from the current study: Given that this study is practitioner-led, and non-prescriptive, one of the key drivers for accepting plural and sometimes contradictory approaches have been the Subject Centres, and the academic tutors themselves. Their perspectives have invariably been that in order to develop creativity, and in order to leave ESD open to full participation by all, settling on single definitions and approaches is foolhardy. However, lest this be seen as a purely 'charitable' approach, they have also cautioned that there are many large areas of dispute and contention within both SD and ESD, which intellectually justify such an approach. We agree.

(2) Participatory approaches: Secondly, these types of approaches aimed at empowering people have been at the heart of SD from the earliest part of its political history. We suggest that participatory approaches are the most suitable for continuing to

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[18] See www.qaa.ac.uk
[19] 'Assenting to existing trends and entailments', rather than challenging them, may have deleterious effects on future generations, an integral aspect for consideration within ESD.

develop ESD at the present time, despite their occasional drawbacks (Cooke and Kothari, 2001). What should such approaches recognise? Simply, that ESD, and within this, SD involves areas of complexity and uncertainty which do not make themselves amenable to single, simple solutions or outcomes. In other words, with ESD it is our view that we are looking at *divergent* rather than *convergent* outcomes. This again follows our initial rationale of a non-prescriptive, practitioner-led approach.

(3) Non-ideological: Thirdly, what better way than to respond to a critique claiming that ESD is 'ideological' than to not only permit, but to deliberately encourage, as many different perspectives on the topic as possible? Of course, *ideological* critiques come from a very specific *ideological* position in themselves — which all too often remains unidentified. This is very unfortunate. However, having accepted this, encouraging diverse approaches makes ESD less of an ideology and more a matter of academic freedom, for the tutor to choose her/his approach.

(4) Emergent properties: Fourthly, it is also not possible to have a single agreed definition of an emergent property. As Bawden, (2004), says: 'it is the 'systems logic' of the 'whole being different (if not greater) than the sum of its parts', that gives power to the very notion of 'emergence'. To the systematist, unpredictable and novel properties emerge whenever different sub-systems are allowed to mutually associate, both within systems, and between different 'levels' within the nested hierarchies in which they are presumed to exist. And this is as relevant to 'learning systems', that rely for their existence on a range of differences inherent in collective discourse, as it is for any other system in 'nature'. … If you want emergence, then you have to allow 'differences' like normative discourse with empirical discourse, to 'interact', and conversely, if you will concentrate attention solely on the fragmented aspects of discourse, emergence will be forever denied.'

(5) Valuing Imperfections: Fifthly, Gonzáles-Gaudiano, (2004) has described the construction of open, 'fractured' (imperfect) proposals which do not claim to be standardised, as an excellent way of generating new ideas from people: 'These imperfections admit the possibility that new future alternatives suggested by new people may be produced. Transmission must be imperfect so that the future is possible.'

(6) Contradictions as Creative Stimulus: Sixthly, and finally, Parker (2004) says: '… knowledge loss will take place when a contradiction that should have been dealt with by Socratic negotiation or pluralist toleration, has been violently resolved by the suppression of one side of the contradiction'. She then deals with (in this case, citing Sayer) a further important implication: 'it shouldn't be surprising to find cases where two or more radically different and indeed incommensurable sets of beliefs have equal practical adequacy'.

102   In this research, this is exactly our conclusion. The multiple views and perspectives, for example, around definitions, or one teaching or content orientation towards ESD proffers the possibility that all are valid, on their own terms. Furthermore, there are other interesting implications. By describing the *multiple perspectives* which it is possible to adopt, tutors new to ESD, may feel much more stimulated than when offered one, simplistic solution, which is hardly appropriate, in any case, for HE level tuition. Indeed, it may be important to preserve the narrative around two apparent contradictions precisely because it will enable an *exciting frission of debate out of which a more exciting range of solutions may emerge* (Parker, 2001). However, this may imply not laziness but hard work, attempting to evaluate contradictions and what they are due to.

103   Finally, exposure to different SD definitions can help ground tutors in their orientation, and it can also help to stimulate different approaches. However, attempting to fit the wide variety of academic life within a single ESD definition leads to simplistic thinking, and limits the perspectives arising from multiple literacies (Gough and Scott, 2004), or 'plural

knowledge systems' (Parker, 2001). Wals and Jickling (2002) argue… that there should be space for deep consensus but also for respectful *dissensus* around sustainability. Such multiple literacies, plural knowledge systems and dissonance is what we have attempted to portray, albeit in embryonic form, within this report.

104   There is room for participatory links between research areas around ESD teaching approaches. The current survey has found many potential connections between different disciplinary areas. There is learning to be done between Subject Centres.

105   A useful narrative has been provided by this report content, on this complex and emergent property.

Conclusions and Recommendations

Conclusions

106   The process of carrying out this research with Subject Centres, involving focus groups and frameworks for teaching sustainability, has in itself raised the profile of ESD. This report will stimulate further debate. It is at the beginning of a process.

107   The report itself is a toolkit. Within it there are teaching methods from which the reader can pick and choose and assess their efficacy and suitability for themselves. Staff will meet barriers to teaching sustainability, these are all discussed. There are solutions to these barriers, but not all of them are in place yet. Several examples of good practice are given. There is an extensive bibliography. The conclusions are that contradictions expressed by participants are actually a way forward, because they lead people to debate and decide for themselves fundamental issues of philosophy and science. The frisson of different approaches makes ESD potentially very exciting.

108   Definitions of sustainability were very variable, and many Subject Centres cautioned against using a single definition. Some respondents recommended using multiple definitions in order to stimulate student involvement.

109   ESD is currently not taught in a standard way at HE level either within subjects or across subject disciplines. There is little interdisciplinary ESD work.

110   The content of sustainability in curricula is diverse, but on the whole tutors stay within their subject areas. So, for example, engineering teaches technological fixes, and English views ways of thinking about the individual's relationship with nature.

111   There were very positive comments on the benefits which would accrue to students, and a general view that their learning experience would be significantly enhanced via ESD at HE level. It was seen to broaden the students' minds and help them act in the world. There is lack of knowledge on the connections between ESD and employment prospects.

112   The emerging good practice models stand out from the examples given above because: (i) they are pushing at the boundaries of the subjects, straying into interdisciplinary areas in order to understand enacting sustainability; and (ii) they engaged in practical ways with the local environment – teaching students to be actors and not mere participators in environmental change.

Recommendations

The recommendations are divided into (1) those evidenced within, and emerging from, this research; (2) those representing the authors' considered opinions:

Recommendations Evidenced Within, and Emerging From, This Research:

1 The Higher Education Academy should continue to explore and develop approaches to ESD teaching and learning and curriculum through the Subject Centres themselves, as well as through an interdisciplinary group focusing on subject connections applying systems thinking and practice. The Academy has interdisciplinary mechanisms in place around Area Studies and ETHICS (Ethics Teaching Highlighted In Contextualised Scenarios). However, it needs to consider what is the appropriate mechanism for ESD.

2 The Academy should provide ongoing support and funding to promote ESD across the subject disciplines in higher education along with support for dissemination of good practice. We would especially emphasise the importance of facilitating the organic evolution of partnerships between both cognate and non-cognate disciplinary groups.

3 The Academy should continue to develop the framework started by this report, by combining and synthesising views where possible and, where not possible, by acknowledging the contradictions, in a positive and supportive way. The framework should include attempts to define ESD, SD and teaching approaches to them within both disciplinary and cross-disciplinary contexts. This will enable further, fruitful debate to take place.

4 The Academy should explore the connections between the ESD and Employability agendas, and should support further action research into how career opportunities and choices of HE graduates might be influenced by the SD agenda.

5 The Academy should seek ways of building the capacity of tutors within the sector to deliver effective teaching and learning in ESD. Special consideration should be given to how the development of institutional L&T strategies and CPD programmes might be influenced to include relevant content. This will be helped by the implementation of the recommendations above.

6 The Academy should establish an ESD stakeholder group comprising key agencies in the sector (e.g. Subject Centres, employers, professional bodies, Graduate Careers) to identify ways of implementing and supporting the integration of ESD into teaching and learning and curriculum. This group should develop a persuasive business case for a VC/senior management audience. This group should complement and seek to work with existing groups such as the DfES Sustainability Integration Group (SIGNET).

7 The Academy along with HEFCE should strive to promote and help promulgate good practice by exploring academic motivation to embed ESD, and by identifying ways of recognising significant achievements in ESD practice.

8 The Academy and HEFCE should seek to identify the connections between the organisational behaviour of HEIs and the embedding of ESD in the taught curriculum. The Academy should also examine the more subtle, background, physical and social elements of HEIs and their impacts on ESD practice.

Recommendations Representing the Authors' Considered Opinion:

9   The Academy should extend the work of the Subject Centres to incorporate the Registration & Accreditation and Research & Evaluation functions and an ESD strategy for the entire organisation should be formalised.

10   The Academy and Subject Centres should explore as a matter of urgency how they should assess and report on progress in ESD development and its embedding across the sector.

11   The Academy should position itself as an exemplar for the sector by ensuring its own organisational behaviour respects the principle of sustainability.

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(See also Appendices 2 and 5 for additional references consulted).

Postscript: Resumés of HEA Subject Centre ESD Development Projects

The following resumés represent the start of dynamic and evolving processes, and are summaries of the current state of Subject Centre perspectives on ESD as supplied to the Academy..

Economics: The Subject Centre intends to initiate: a potential network of UK economics lecturers working within SD, or wishing to do so; a statement about ESD in economics, including what graduates need to know about SD; a catalogue of available resources, including disciplinary bodies, identification of other disciplines relevant to our own work in ESD, and possible collaborative projects, and an outline of proposals for future work in ESD in economics. The following ESD projects will be worked on in the next year: The committee for heads of economics departments (CHUDE) will argue for including SD in employability and benchmarking and a national and international audit will be started on SD courses/materials/methods in economics courses. We will also continue to facilitate the networking of specialist areas and create a research directory of lecturers interested in SD. We have advertised mini-project funding whereby one or two lecturers may modify a course syllabus and pilot the course with their students. We will advertise a student essay contest. Some tutors are concerned that the RAE creates disincentives for SD work as the specialisms involved are not ranked as highly as others, and barriers prevent interdisciplinary work.

English: Concerning definitions of SD, most of the categories supplied do not fit easily into the vocabulary of a Humanities subject such as English. They are mainly derived from the environmental and social and political sciences. We have applied them to English as far as possible, sometimes by widening their definition. We regard one model as most relevant because it stresses the importance of 'equity' and 'empowerment' as well as 'equipment' and 'economy'. Ecocriticism, as a sub-discipline within English, has tended to be seen as a means of linking literature and 'the earth', but it also engages with questions of equity and empowerment insofar as it overlaps with longstanding political orientations in literary study such as feminism, Marxism and postcolonial studies. The branch of this disciplinary area that has a mission to connect literary criticism with the principle of sustainable development is ecocriticism, a movement in literary criticism that emerged in the early 1990s. Ecocriticism is literary and cultural criticism from an environmentalist viewpoint: an application of literary criticism resembling feminist criticism and postcolonial criticism. The aims and activities of ecocriticism are the following: (1) Particular texts are evaluated in terms of their environmentally harmful or helpful implications; (2) Ecocritics analyse the history of concepts such as 'nature', 'human', 'animal', 'rationality' and 'civilisation', in an attempt to understand the cultural developments that have led to the present global ecological crisis; (3) New literary significances are identified that 'nature', or certain features of landscape, for example, will have, in the light of the current ecological crisis. Some traditional significances – nature as eternal compared with the transience of human works, for example – are identified as needing to change; (4) Non-fiction nature writing, previously seen by most types of literary critic as a minor genre of literature, is repositioned as a major genre; (5) Comparative studies are made between the literature of indigenous, non-industrial cultures, the literature of industrial and colonial cultures and the literature of postcolonial cultures, to evaluate all of these in ecocritical terms and produce a new ecocritical literary canon; (6) Scientific concepts relevant to sustainability, such as 'ecosystem', and philosophical concepts such as 'anthropocentrism' and 'ecocentrism', are defined for students and brought into the vocabulary of literary criticism; (7) The emphasis in many types of literary criticism on the text as a self-contained signifying system is counteracted by an insistence on attention to the relationship between the text and the world, the latter being understood in ecological terms. (8) In Creative Writing (normally included in English for Subject Centre, AHRC, QAA and RAE purposes), creative work dealing with environmental topics is taught and encouraged. English has a strong tradition of defining itself as

a space where other values may be voiced than those of industrial rationality, commodification and consumerism. Because it draws in concepts from scientific ecology, ecocriticism invites students to reflect upon the relationship between types of knowledge normally regarded as separate. ESD in English also asks students to apply their discussion of literary texts to other areas of their lives, such as their leisure activities, the forms of transport they use, their career intentions, indeed their whole pattern of consumption. The commonly held attitude among students that literature is there to provide an escape from serious problems, and that preferences are merely personal, will receive a new challenge from ecocriticism.

Engineering: The Engineering Subject Centre has worked collaboratively with the Royal Academy of Engineering (RAEng) and its Visiting Professors Scheme in Sustainable Design, to evaluate the adoption of ESD in their HEIs, and, through workshops and commissioned work, has produced learning and teaching resources for its teaching academics.

Hospitality, Leisure, Sport and Tourism: A short online survey was designed to collect information about the range of ESD provision within the hospitality, leisure, sport and tourism subject areas, and specific examples of how this topic is delivered and assessed within programmes. A copy of the survey is available at www.hlst.heacademy.ac.uk/projects/esd_survey. Sustainable development issues are most widely covered in tourism programmes, where, it is suspected, some element of ESD will be included in virtually all courses, as it is a core part of the subject area. Hospitality and leisure programmes include ESD more sporadically. Standard management curricula would include aspects such as corporate social responsibility etc. In leisure, inclusion of sustainability issues is more likely to relate to planning and policy development. Most of the respondents to the survey who reported on sport courses stated that there was no element of sustainability in their programmes; those who did include it did so at a very low level. A wide range of ESD elements have been reported, even given the low response rate. The most popular are environmental impacts, corporate social responsibility, social responsibility, triple bottom line, and environmental management. Others mentioned less frequently are: planning, benchmarking, certification, policy assessment, project sustainability, delivering ESD, and ethics. Approximately one-third of respondents used a number of different definitions of sustainable development within their programme. The most popular one to be cited was that from the Brundtland report (managing the present without compromising the future), and others included 'education to protect future generations' and 'cultural, environmental and economic stability'. The message from the responses received so far is that 'real-life' examples are the most effective way of engaging students in sustainable development issues. Use of fieldwork and site visits is the most popular method cited, closely followed by case studies, and projects. Other examples included formative assessment, investigative journalism, debate and use of video. Seven case studies are currently available and a number more are currently being finalised. Further activities planned by the network are to: encourage further contributions to the survey in order to obtain a more comprehensive view of the scope/level of ESD within hospitality, leisure, sport and tourism; write an updated report based on these results; identify and write up further case studies, particularly from hospitality, leisure and sport.

Information and Computer Science (ICS) and Mathematics, Statistics and Operational Research (MSOR)): ICS and MSOR has agreed to (1) compile a web-based audit of current practice in the ICS and MSOR disciplines; (2) conduct a joint focus group to discuss the relevance of the ESD agenda to the ICS and MSOR communities, and to begin to define the knowledge, skills and attributes which ICS and MSOR graduates might require in order to promote ESD within their professional lives; (3) explore the current extent of work by the professional bodies in relation to ESD, and identify further areas for collaboration; (4) commission a (limited) series of case studies to provide exemplars of current good practice in relation to ESD within the ICS and MSOR communities; (5) develop an initial web-based presence providing immediate access to resources in support of raising knowledge and awareness of ESD. Areas where ESD has been incorporated within ICS include: information systems strategy, electronic governance and e-business; computer aided product design; information systems consultancy

projects; and professional issues. A further respondent indicated that ESD could be incorporated as a relevant component in a computer ethics curriculum. The results of the MSOR survey were as follows: Of the respondents, several had previously encountered the term ESD. However, only one of these was from a 'traditional' Mathematical Sciences department. The greatest awareness of ESD appeared to arise from within Engineering departments, particularly in relation to sustainable manufacturing processes. Three respondents indicated areas for possible inclusion of SD issues, particularly in relation to statistics, and mathematical modelling of the economy and environment. A resource guide on ESD has been developed and will shortly be available on the ICS website at: www.ics.heacademy.ac.uk/Resources/ESD.

Within the MSOR Community few resources identified are discipline specific. This perhaps indicates the currently lack of either engagement or awareness of SD and ESD within the community. Resources will continually be added as they become available, and they will be embedded within the website shortly.

Languages, Linguistics, and Area Studies (LLAS): At first it was difficult to identify clear links between the ESD agenda and the discipline-specific concerns of LLAS. Although links to endangered languages and the study of 'indigenous' communities came to mind, it seemed that the ESD agenda was largely the property of natural science and social science disciplines. The language used to talk about ESD uses a largely scientific vocabulary. However, now is an appropriate time to ensure that LLAS practitioners make a contribution to the debate. As a Subject Centre we were reluctant to settle on a particular definition of sustainable development for two main reasons: First, there is the uncertainty about what sustainable development is and it would be unwise to impose a particular definition which served to exclude individual practitioners who may have an important contribution to the debate. Second, by the nature of the concerns of their disciplines, languages and linguistics practitioners can be excited by the language of sustainability in and of itself. Naturally, LLAS practitioners will not only be interested in the English language understandings of sustainable development, but will also be interested to investigate how these contested discourses translate (or fail to translate) into other languages and cultures. This initial report is limited in scope and there is undoubtedly activity that has not been uncovered at this stage. Language and area studies students are well placed to observe human responses to environmental concerns. After all, the explanations for *how* climate change is taking place are scientific, but the local, national and global responses are profoundly human. Culture plays an important role in informing our understandings of why scientists may be believed, ignored or dismissed. LLAS students, we presume, have a strong interest in understanding other cultures. This has a strong ethical dimension about the concern our students have for 'distant others'. Language learning and the study of other cultures place students into a social and geographical space where they engage with these others. On becoming sustainability literate, students will gain a greater understanding of the implications their choices may have on others. Tourism and trade are both important ways in which individuals engage with cultures other than their own. Intercultural competence is not only concerned with the engagement across geographical space, but it can also be a bridge to translate the disciplinary gap between the humanities and the sciences. LLAS is keen to be to active in this area to ensure that our constituency is able to see that sustainable development is inherently culture-bound and is not merely a technical concern for certain other disciplines. The ESD section of the LLAS website will be publicised and we will cite ESD as a targeted topic in future calls for papers and case studies of good practice. However, we will endeavour to translate the ESD agenda out of its scientific framework of reference and into a vocabulary that makes the debates more accessible to the LLAS community.

Philosophical and Religious Studies (PRS): Each of the subject areas is an academic discipline in its own right with a distinctive history and set of methodological tools at its disposal. Clear distinctions are also made between theology and religious studies. The work that the subject centre does recognises the value of interdisciplinary work, yet also the importance of maintaining disciplinary identities to preserve the unique perspective that each subject area can bring to the complex questions facing today's global society (such as sustainability issues). Therefore, future work in this area by the PRS Subject Centre would hope to give each of these three disciplinary areas its own voice. Mainly, while ESD is not an 'essential' topic of study for

PRS, there is already a strong tradition of teaching and research in this area within philosophy, theology and religious studies. Within these disciplines students are encouraged to engage in critical thinking, to challenge their assumptions and to become aware of different cultural perspectives on the issues that are taught. For instance, whereas in philosophy one might find modules on environmental ethics, business ethics or development ethics, in religious studies the emphasis would rest upon the ways in which the teachings and practices of different world religions intersect with sustainability concerns. Theology, by contrast, would generally focus upon the Judaeo-Christian tradition. Some examples of ESD in practice follow: Harvard University's 'Forum on Religion and Ecology':environment.harvard.edu/religion/main ; the International Society for Environmental Ethics, newsletter can be accessed at www.cep.unt.edu/ISEE/index;the Theological Education to Meet the Environmental Challenge is at www.webofcreation.org/temecpage/temec;Alliance for Religions and Conservation (ARC): www.arcworld.org/about_ARC;Religion and Ecology, group web site, American Academy of Religion www.religionandnature.com/aar/;Social Science Information Gateway: Anthropology and Environment: www.sosig.ac.uk/roads/subject-listing/World-cat/antecol. The primary goal for the next phase of this project will be the creation of a network of philosophy, theology and religious studies academics interested in ESD to establish a clear position statement about the relevance of PRS to the ESD agenda. This will be accompanied by evidence of existing practice; an assessment of the ways in which PRS currently intersects with other subject areas in their teaching of SD and suggestions of ways in which such links could be developed further; we will consider ways in which we can incorporate an understanding of the contribution of PRS to ESD into the 'continuing professional development' of staff in HE; an evaluation of pedagogical styles utilised in the teaching of SD in our subject areas *vis a vis* pedagogies employed in other disciplines; a directory of bodies – both academic and non-academic - that have a philosophical and/or religious studies approach to ESD; and a discussion of the ways in which PRS can contribute towards encouraging graduates to become SD literate. We aim to link this output to the ongoing development of our student employability profiles for both philosophy and religious studies;

Psychology: That psychology can make a contribution to Education for Sustainable Development (ESD) should need little argument. At root, psychology is the study of how and why humans (and other animals) think and behave as they do, and of the ways in which these thoughts and behaviours can and cannot be changed. Indeed, it is almost impossible to see how the development of ESD could proceed successfully *without* taking psychology into account. Psychology is an extremely multifarious discipline, and there is much within psychology that would potentially be of use. Nonetheless, it is possible to determine a number of sub-disciplines within psychology that promise particular insight given the ESD agenda. These are: (1) environmental; (2) social; (3) community; (4) evolutionary. These areas can give potential range and depth to ESD. They also show the extent to which quantitative, qualitative, practical and theoretical approaches within psychology all have something significant to offer in this context. Providing a useful or easy-to-handle definition of SD within the context of psychology was viewed as problematic, and this difficulty also served to hinder the development of (E)SD-related work in psychology. In general, currently, there is little ESD within psychology. Where ESD is present, it is most usually delivered as one aspect of environmental psychology. The most substantial ESD within psychology occurs in the context of student projects and dissertations. Localised, real world, project-based work provides the main opportunity for students to engage with SD as part of their psychology education. It seems that the RAE – in its current form – presents a substantial obstacle to the development of SD-related work in psychology. Significant changes to the RAE may be required if ESD is to be more widely or more deeply embedded into psychology curricula. Some possible routes are described for the more successful embedding of ESD within psychology. However, there is a clear need for a considerable amount of further research to be undertaken before any of these routes are taken. The psychology community is likely to be highly resistant to the inclusion of SD within psychology curricula. Attempts to embed ESD within psychology are likely to fail unless extreme care is taken to achieve such embedding in a sensitive and mutually beneficial manner. Mere provision of information and imposition of requirements is extremely unlikely to succeed.

Sociology, Anthropology and Politics (C-SAP) and History, Classics and Archaeology (HCA): The exploration of sustainability in a critical manner is a key area of social science activity: Critical theory is prominent for its presence both as distinctive subject area and as a component of social science provision. This is important because preliminary interviews show that tutors are concerned that the insights of critical theory may be set aside to answer other agendas around ESD. To engage social science academics in sustainability in ways which impact on students, it is important to engage academics through discourses of critical theory rather than through yet another skills pack. Social science academics are likely to take less notice of provided materials that are not developed through clear social science thinking. Thus the taking of generic materials and reworking them for a social science audience may be less successful. What may be more productive is to use a critical social science approach from the outset. This is particularly relevant to environmental issues but goes much wider than this. When asked about cross disciplinary themes four themes of particular importance were raised by tutors, and are here ranked in order here of prominence: (1) inter-disciplinary developments; (2) applied aspects, linked to potential employability; (3) globalisation;
(4) practical/justice. Sustainability is both a potential and an actual feature of course provision that, in effect, secures interdisciplinary activity. To expand on the other themes: globalisation is an obvious theme and interest. The emphasis on economic globalisation provides one focus for sustainability but so too do social and political aspects of globalisation. The practical area of citizenship is a similar provider of focus on sustainability. Respondents also mentioned the development of trans-nationalism, colonialism and its legacies which is particularly relevant to sustainability work. Under (4) justice respondents referred to a growing focus both within their disciplines and within student demand for work on war, terrorism, torture and human rights, environmental and medical ethics, protest, and the local/global mix. The work on ESD within C-SAP and HCA is planned to continue with facilitation of focus groups and development of other material.

Appendix 1: Higher Education Academy Brief

Research deliverables:

Deliverables for the research included the following: An executive summary and recommendations; an ESD pedagogy toolkit with short briefings on ESD teaching approaches, including generic principles, and a dissemination strategy aimed at encouraging effective learning across the sector giving guidance to Subject Centres and their subject communities. Finally, identification of ESD research questions and implementation issues emerging from the research, especially relating to curriculum and teaching approaches.

Aims and objectives:

1   The research consisted of the following four areas. They are each described below, and related to the objectives relating to curricula (C1., C2., etc.), pedagogy (P1., P2., etc.), and the Academy's ESD remit (HEA1):

2   **Literature Review:** A desk-based literature review of international ESD literature, applied to specific disciplinary areas. This would contribute towards meeting the following objectives:
P4. *What can we learn from existing models?*;
P5. *What are the factors that make a model successful?* and
P.6 *Non-HE models of embedding ESD learning.*
Significantly, from this work, a representative range of
P.1 *Pedagogic approaches commonly used in ESD;*
P.7 *Generic pedagogic principles.*
would be derived, to be used in the Subject Centre Focus Groups below

3   **Subject Centre Focus Groups (SCFGs):** One or more meetings, facilitated by the research team. These would be used to determine how different SCs oriented themselves to ESD in terms of
C1. and C3. *Defining ESD in relation to Subject groupings;*
C2. *Identification of ESD core curriculum components;*
P1. *Pedagogic approaches.*
SCFGs were presented with 11 pedagogic approaches to ESD**,** and 27 SD connections or content areas; plus 10 Barriers and Solutions.

4   **Emerging Good Practice (EGP) models:** A survey, analysis and 'mapping' of selected models.
The models would have similar metrics to the SCFGs applied to them, and would therefore yield comparable information regarding:
C2. *Identification of ESD core curriculum components;*
P1. *Pedagogic approaches.*
In addition, they would cover the following pedagogic targets:
P.3 *Best Practice Models;*
P.4 *What can be learnt from EGPs;*
P.5 *What are the factors that make an EGP model successful?*

5   **Visits to investigate EGP models:** Visits to institutions to investigate how selected models work in practice. These would consolidate P1.-P.5 and would also help to reach conclusions concerning:
P7. *What generic pedagogical principles can be drawn from EGP models?*

6   Assessments of Barriers and Solutions to Successfully Embedding ESD:
This was carried out via enquiry to the SCFGs.
P9. *What are the barriers inhibiting HE staff from embedding ESD into their teaching, and how might these be overcome? What are the incentives to embed ESD?*

7   **Consolidation of Individual Subject Centre ESD Development Projects with the Results of 1.-5. above:** Activity surrounding ESD and Subject Centres was noted, and combined with the results arising from this core project to produce the final analysis.

Several, more broadly-based objectives were also included, namely:
P2. *How do these [pedagogical approaches] relate to different understandings of sustainability and to different subjects, disciplines and paradigms?*
P8. *How can different ESD models be utilised so that they provide practical guidance, tools and/or materials for embedding ESD in or across subjects, departments, degree schemes and individual modules?*
C1. *How could ESD in HE usefully be defined for the Higher Education Academy and the Subject Centres?*
C2. *Is there a common core curriculum to ESD in HE?*
C3. *How is 'sustainable development' variously defined, particularly by different subject groupings and what alternative futures for society do these views suggest in the short, medium and long term?*
C4. *What will these envisaged social changes mean for how we are educated - what new skills and knowledge might be required and what does that mean for what is taught now?*
HEA1. *How can ESD contribute to enhance the whole student experience?*

Appendix 2: Subject Centre Questionnaire and Briefing

Questionnaires were circulated to all 24 Subject Centres, together with Briefing Notes. Both are included here.

Higher Education Academy

Questionnaire on Sustainability Orientation of Subject Centres

Introduction

The results from this questionnaire will contribute directly to two areas of research being carried out for the Higher Education Academy (HEA): (1) *Embedding Education for Sustainable Development (ESD) into Higher Education* (research team: Gerald Dawe (GeraldDawe@aol.com tel. 01432 343262), Dr Rolf Jucker (R.Jucker@swansea.ac.uk) and Professor Stephen Martin) and (2) *Individual Subject Centre ESD Projects*.

The research team appreciates that different Subject Centres are at different stages with their engagement with SD and ESD. It is therefore *not expected* that all SCs will be in a position to provide answers to all the questions by the deadline. We regard this as a two stage learning process:

1. The SCs will answer this questionnaire with their initial thoughts, reflecting their current stage of engagement. **Deadline:** Please e-mail one completed form to Gerald Dawe by **11 March 2005**.
2. The same questionnaire will also form the basis of the template for submission of *Individual Subject Centre ESD Projects* (deadline as set out in the invitation for Expressions of Interest 7 May 2005). This would allow for the evaluation of any learning taking place in the interim period.

Please note:
The results of individual Subject Centres will not be published, but may be used generically, without attributing name(s) to SCs or respondents. Your co-operation is appreciated in ensuring that we receive responses early on in our research so that the outcomes closely reflect SCs needs.

Gerald Dawe will telephone and run through the questionnaire with you soon.

1. **Subject Centre name:**

2. **Person filling out the questionnaire:**
   Email address:
   Contact telephone number:

DEFINING SUSTAINABILITY FOR YOUR SUBJECT CENTRE

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3. **Which definition of sustainable development (SD) is favoured by, or viewed to be most appropriate to, your Subject Centre?**

Note: Help in the form of possible definitions is available within the attached document: 'SDESD Briefing Notes'. We appreciate that there are many more definitions 'out there', so if you want to use different ones feel free to do so.

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4. **What is the relevance of SD within the disciplinary areas managed by your Subject Centre?**

Note: Help and hints in the form of a list of possible sustainability connections to your subject area(s) is available in the attached document 'SDESD Briefing Notes'.

PEDAGOGY AND RESOURCES

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5. **How is ESD delivered within your SC area?**

Note: This question specifically refers to the pedagogical approaches used to deliver SD in your SC area. Is it delivered like any other topic (through traditional means of delivery in lectures, seminars and tutorials)? Or are other approaches used? Is the focus of delivery on *what* or on *how* or on *where* or on a combination of the three? For some initial, but by no means exhaustive, context and ideas, please refer to the second part of the appended document 'SDESD Briefing Notes'

6. **Can you provide example(s) of successful ESD models operating within your Subject Centre disciplines within UK universities or HEIs?**

Course Tutor	Course	University or HEI	Notes
[add more lines if necessary]			

7. **Please provide a catalogue of available resources within your SC on SD / ESD**

PRACTICAL CONTEXTS FOR TUTORS

This section is intended to identify the milieu within which tutors operate, and possible factors encouraging/inhibiting ESD from taking place.

8. **Provide a directory of disciplinary bodies relevant to SD/ESD, an overview of their work, and a history of engagement with them**

SD / ESD body	Examples of work with them	History of engagement
[add more lines if necessary]		

9. **Please fill out the table by supplying some examples of learned bodies/journals operating within your Subject Centre disciplinary areas, and their orientation towards ESD**
   [Place an asterisk (*) in the relevant 'Orientation' box]

Learned body/journals	Orientation towards ESD			Other comments:
	Actively promoting ESD or SD	Neutral	Likely to be not in favour of SD or ESD	
[add more lines if necessary]				

10. **Now do the same for professional associations and other relevant bodies (a few general ones have been filled in for you: please rate them as well)**

Professional associations and other bodies	Orientation towards ESD			Other comments:
	Actively promoting ESD or SD	Neutral	Likely to be not in favour of SD or ESD	
Government				

DfES (or equivalent) HE funding councils Research Councils HEI Senior Management Team ProVC Learning and Teaching Higher Education Academy   [add more lines if necessary]

11. What are the barriers to enacting ESD within the Subject Centre disciplinary areas?
[Fill in barriers not on the list or place an asterisk (*) in the relevant 'SC Barrier' box]

Barriers	SC Barrier (please fill in)
Awkward fit with subject area Perceived irrelevance by staff Curriculum too crowded already and lack of time to update courses Internal accreditation, validation systems, benchmarks Requirements of professional associations Lack of staff expertise and the need to acquire new knowledge Perceived irrelevance by students Inability of students to grasp the issues Lack of institutional drive and commitment Lack of staff awareness Financial restrictions Confusion over what needs to be taught Lack of market for students Lack of relevant course examples Reality of future career conflicts with sustainability teaching Lack of perception of big environmental problems Lack of academic rigor/misunderstanding No barriers identified	

12. Attempts to run HE institutions more sustainably can provide learning opportunities for ESD. Have you come across examples of positive relationships between such attempts and learning or teaching in the disciplinary area of your SC?

13. Identify other disciplines outside your Subject Centre which might be relevant to your work in ESD, and mention potential collaborations with other SCs.

THE WHOLE STUDENT EXPERIENCE

14. How can ESD, as your Subject Centre understands it, contribute towards the whole student experience?

15. What knowledge, skills and attitudes might graduates require to live and work in a sustainable way?

16. Do the students or tutors within your Subject Centre disciplinary areas already have links with external employers who require some evidence of ESD from them before considering their employment?

17. Is there demand for ESD within courses from students?

FURTHER DEVELOPMENT 2005/06

18. **What would a generic ESD toolkit need to provide in order to make it useful to your SC?**

19. **Please outline proposals for future work considered necessary to develop, implement and evaluate innovative approaches to ESD.**

Please return the completed questionnaire to GeraldDawe@aol.com

Higher Education Academy

Questionnaire on Sustainability Orientation of Subject Centres
Briefing Notes

These notes accompany the questionnaire concerning the Higher Education Academy's research into (1) *Embedding Education for Sustainable Development (ESD) into Higher Education* and the (2) *Individual Subject Centre ESD Projects.* The standardised questionnaire accompanying this document has been developed to integrate results between Subject Centres (SCs) and to aid the collation of results between SCs. These notes are divided into:

- **What is Sustainable Development (SD)?**
- **What is Education for Sustainable Development (ESD)?**
- **Skills for ESD**
- **Pedagogical approaches for ESD**
- **Sustainability Connections to Subject Centre disciplinary areas**

They are intended to provide hints and help for your responses. We appreciate that there are many more definitions, and interpretations 'out there', so if you want to use different ones feel free to do so.

What is Sustainable Development (SD)?

1   We believe it is important to apply an open mind to sustainable development (SD) as an emerging field in Higher Education research and learning and teaching. Therefore we do not want to suggest a single definition of SD or ESD (Education for Sustainable Development). Rather we agree with HEFCE when they state in their SD Strategy/Action plan: 'we view it as institutions' responsibility to define what sustainable development means for them through dialogue with their students, staff and other stakeholders.' (HEFCE, 2005, 11, §52)

2   Nevertheless, these divers definitions tailored to each institution's or practitioner's needs are not operating in a void. We therefore present in the following a selection of SD and ESD definitions which we regard as representative of the myriad definitions in circulation. We present written and visual definitions to suit different learning styles.

3   The most widely used definition of Sustainable Development is the one developed in the Brundtland report *Our Common Future*:

SD is 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (*Our Common Future*, 1987, 43).

This definition stresses the concept of *intergenerational* justice. We have no right to degrade our planet to prevent future generations from living as well as we do.

4   The UK government's SD definition is as follows:

- Social progress which recognises the needs of everyone.
- Effective protection of the environment.
- Prudent use of natural resources.

- Maintenance of high and stable levels of economic growth and employment. (http://www.sustainable-development.gov.uk/what_is_sd/what_is_sd.htm [accessed 24/01/05])

This definition has been criticised widely because it is ultimately not possible to reconcile high levels of economic growth with the scientific fact that we are living in a materially non-growing, closed system of which the economy is just a subsystem.

5   In the last few years another definition has gained currency, especially in the business world. It is usually called the three-legged stool definition:
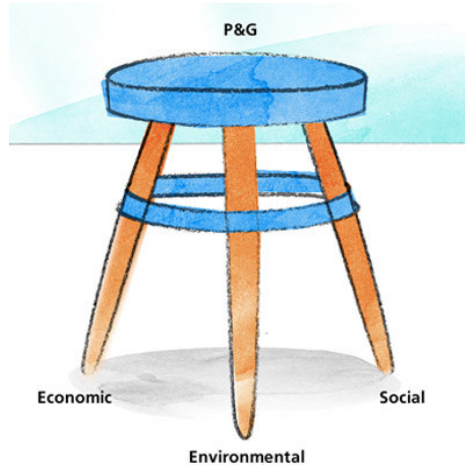
Figure 1: Source: Procter&Gamble,
 http://www.scienceinthebox.com/en_UK/sustainability/sustainabledevelopment_en.html

It stresses the interdependence of the three elements. If you take one leg away, the stool collapses. The problem with this reductionist definition (which is often presented as in figure 2 below) is that it, factually wrongly, assumes that all three elements are equally important and interact on the same level
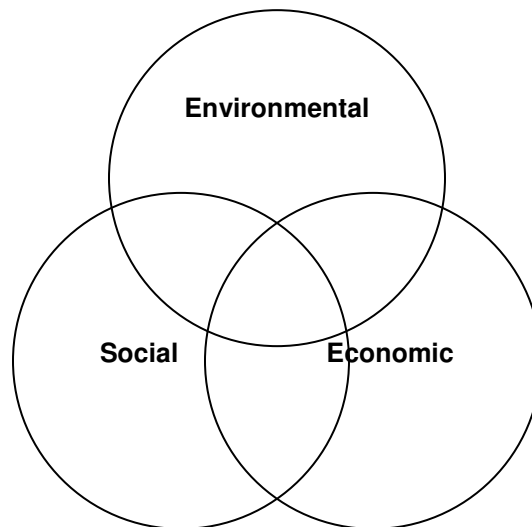

Figure 2

6   An interesting further development of the three-legged stool definition is represented by the following figure. Even though it still doesn't give any notion of the relative dependence

of different spheres from each other, it at least re-introduces the dimension of intergenerational equity from the Brundtland definition:
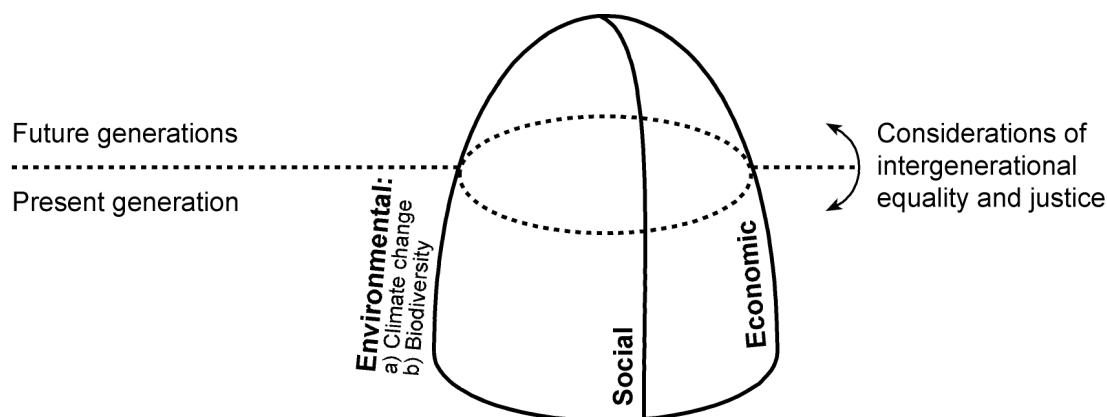

Figure 2 Source: Dawe, Gant and Taylor, 2003

It also includes specific environmental concerns relating to the Framework Convention on Climate Change and the Convention on Biodiversity, which were outcomes of the Rio 'Earth Summit' in 1992.

7   The so-called 'Russian doll' definition addresses this problem by showing the hierarchical relations between the three elements. There is simply no life at all without the environment (planet earth), and the economy is also a subsystem of the social sphere.
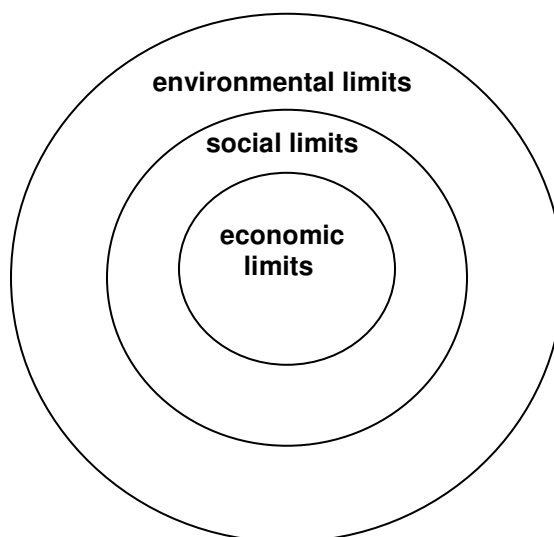

Figure 3

8   The following model again stresses the fact that all other elements are sub-systems of the ecosphere, but it tries to emphasise the interdependence of the subsystems. It also attempts to make more visible two other important subsystems (empowerment: the political system; and equipment: science and technology), which are crucial drivers for (un) sustainability:
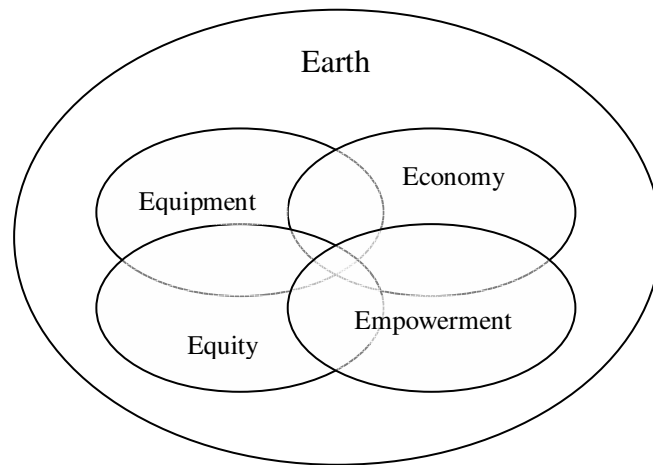
Figure 4: adapted from Jucker, 2002, 33.

9 The following figure illustrates very sharply both the fact that we are living within a materially non-growing, closed system which is only open to energy inflow from the sun. The tap on the left-hand side symbolises technology which is accelerating overuse of resources beyond sustainable limits.
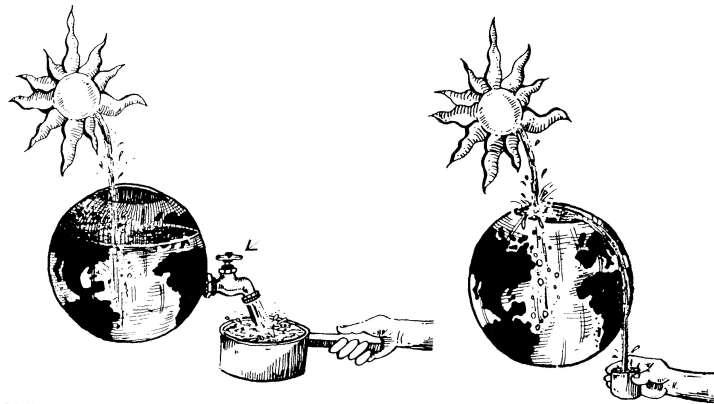

Figure 5: taken from Wackernagel/Rees, 1996, 34.

10 This figure is a visualisation of the scientific laws underlying the so-called four system conditions developed by The Natural Step:

- **System Condition 1:** Substances extracted from the Earth's crust must not systematically increase in nature. This means that, in a sustainable society, fossil fuels, metals and other materials are not extracted at a faster pace than their slow redeposit into the Earth's crust or their absorption by nature.
- **System Condition 2:** Substances produced by society must not systematically increase in nature. This means that, in a sustainable society, substances are not produced at a faster pace than they can be broken down and reintegrated by nature or re-deposited into the Earth's crust.
- **System Condition 3:** The physical basis for the productivity and the diversity of nature must not be systematically diminished. This means that, in a

sustainable society, the productive surfaces of nature are not diminished in quality or quantity, and we must not harvest more from nature than can be recreated.

- **System Condition 4:** We must be fair and efficient in meeting basic human needs. This means that, in a sustainable society, basic human needs must be met with the most resource-efficient methods possible, including a just resource distribution. (The Natural Step 1999).

11 The last model, increasingly used in the UK, is the Five Capital Model. It also implies a hierarchy, because a capital which is lower down the list is dependent on the capitals listed previously:
- **Natural capital** is any stock or flow of energy and material that produces goods and services. It includes:
  - *i* **resources** – renewable and non-renewable materials
  - *ii* **sinks** – that absorb, neutralize or recycle wastes
  - *iii* **processes** – 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** consists of the institutions that help us maintain and develop human capital in partnership with others, for example families, communities, businesses, trade unions, schools and voluntary organisations.
- **Manufactured capital** consists of material goods or fixed assets which contribute to the production process rather than being the output itself, for example tools, machines and buildings.
- **Financial capital** plays an important role in our economy, enabling the other types of capital to be owned and traded. But unlike the other types, it has no real value itself but is representative of natural, human, social or manufactured capital, for example shares, bonds or banknotes.

Sustainable development is the best way to manage these capital assets in the long term. (developed by the Forum for the Future [www.forumforthefuture.org.uk]).

12 From all these definitions we can derive SD parameters or criteria which we have also used to assess the levels with which existing ESD practice are engaging with a holistic, rather than reductionistic view of SD:
- **Diversity:** respecting and valuing both human diversity – cultural, social and economic – and biodiversity.
- **Needs and rights of future generations/ intergenerational justice:** understanding our own basic needs and the implications for the needs of future generations of actions that we take today.
- **Uncertainty and precaution:** acknowledging that there is a range of possible approaches to sustainability and that situations are constantly changing, indicating a need for flexibility and lifelong learning. The likely overall long-term impact of any action should be assessed and we should beware of developments which reduce our options in the future and constrain our freedom to choose. Reversibility, i.e. the ability to correct mistakes, would therefore be a central aspect of a sustainable society.
- **Social justice:** acknowledging that global equity and justice are essential elements of sustainability and that basic needs must be met universally.
- **Interdependence:** understanding how people, the environment and the economy are inextricably linked at all levels from local to global.

- **Citizenship and stewardship:** recognizing the importance of taking individual responsibility and action to ensure the world is a better place. (adapted from SDEP (1998), Annex 4C) The concept of stewardship recognises that we have no property or other rights on our planet, but a duty of care which means respecting the past as well as the future (Nebel/Wright, 2000, 11).
- **Acceptance of limits / Efficiency (improved resource productivity) and Sufficiency (dematerialised lifestyle)**: recognising that in a materially non-growing, finite system, there is a total global upper limit on consumption and resource throughput. There are also limits to resource efficiency, so that 'the good life' has to include strategies to live well with less.
- **Deceleration**: recognising that real learning, understanding and wisdom take time. In fact, all good things in life – a nutritious, home-cooked meal, a meaningful friendship, love and peace – take time and cannot be rushed.
- **Small is beautiful**: It is well known that the effects of our actions adhere to the following formula: 'Impact (on the earth) = Consumption x Technology x Population [I = C x T x P]' (*Lugano Report*, 1999, 32). As soon as one starts to take the complexities of life and the limits of the biosphere into account, only small, transparent, controllable set-ups prove to be sustainable. It follows that every consumption one *doesn't* make is contributing to sustainability, as are small-scale decentralised technologies.

What is Education for Sustainable Development (ESD)?

13 What do we mean when we talk about Education for Sustainable Development? Both the term itself and the notion behind it has been criticised as ideological by Jickling and others, but it is generally accepted to mean one of the following.

14 *Education for sustainable development (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, *First Annual Report 1998*, 30)

15 In the context of the United Nations Decade of ESD, UNESCO is using the following definition: '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. ESD applies transdisciplinary educational methods and approaches to develop an ethic for lifelong learning; fosters respect for human needs that are compatible with sustainable use of natural resources and the needs of the planet; and nurtures a sense of global solidarity.' (www.unesco.org/education/desd/)

16 The House of Commons Environmental Audit Committee simply stated that ESD is 'consistent with what many would consider a good all-round education' (*Learning the Sustainability Lesson*, 2003, 10).

17 We would, however, agree with Sterling that Sustainability is a different worldview, another paradigm:

Sustainability does not simply require an 'add-on' to existing structures and curricula, but implies a change of fundamental epistemology in our culture and hence also in our educational thinking and practice. Seen in this light, sustainability is not just another issue to be added to an overcrowded curriculum, but a gateway to a different view of curriculum, of pedagogy, of organisational change, of policy and particularly of ethos. (Sterling, 2004, 50)

Education is, together with the economy, the media, the social sphere and the political system, one of the belts which transmit ideologies and lifestyles from one generation to the next. Unless education becomes 'sustainable education', as Stephen Sterling calls it (Sterling, 2001), there is little chance that we can manage the transition to sustainability.

Skills for ESD

18 Drawing from the international literature, we can identify the following skills which are identified as significant for ESD:
- To generate in students an appreciation of the importance of environmental, social, political and economic contexts to their disciplines.
- To provide students with a broad and balanced foundation of Sustainable Development, its key fields, and the main debates within them, including the contested and expanding boundaries of the subject.
- To create a stimulating and supportive environment for inter- and transdisciplinary learning and research.
- To enable high quality transformative learning in a creative, reflexive and participative process which is receptive to students' needs and views and engages the whole person.
- To enable students to understand the different methodologies of the humanities, the natural and social sciences and their relative merits to approach specific questions.
- To enable students to seek solutions in an adequate and non-reductionist manner for highly complex real life problems (including the environmental, economic, social, cultural, technological, moral and political dimensions of Sustainability).
- To enable students to make critical judgements and think creatively and holistically.
- To enable students to develop a high level of self-reflection (both personal and professional).
- To enable students to think critically about the nature of knowledge, and about the ways in which knowledge is produced and validated.
- To enable students to identify, understand, evaluate and adopt values conducive to sustainability.
- To enable students to develop social and environmental responsibility.
- To enable students to bridge the gap between theory and practice – in SD only transformative action counts.
- To enable students to participate creatively in interdisciplinary teams, contributing co-operatively to meaningful outcomes.
- To enable students to manage change (including identifying and investigating issues, seeking, implementing and evaluating solutions).

Pedagogical approaches for ESD

19 *Educators as role models and learners*: If educators want to make progress in turning Euro-American societies into something more just and sustainable, no amount of preaching to students, no amount of writing and arguing will do. If the tutors do not change themselves and their lifestyle to be role models for the students and their communities alike – akin to the function of elders in indigenous societies –, there will be no transformation. Gandhi's dictum is here as relevant as ever: 'if we desire [that] change, we must first change ourselves' (Gandhi, 1999, Vol. 24, 22). But this clearly

implies that the educators first have to educate themselves with regard to sustainability before they can think of empowering their students.

20 ***ESD needs to enact change here and now***: The above also means that we need to live and be that change here and now in our setting. This is a local issue, which shouldn't be delegated or deemed unimportant in the face of global challenges. Change will never come about if we continue to dream and fret about global changes, world summits and international agreements: change happens, as Ivan Illich observed, by 'becoming fully present to those close enough to touch' (Illich and Rahnema, 1998, 108). This, interestingly enough, correlates with Rahnema's observation that vernacular societies are 'generally formed by communities with a limited number of members' (Rahnema, 1998, 113). In other words, the close involvement of any educational practice into the local community is essential.

21 ***Critical thinking***: This is an important meta-skill: 'students need to be able to think critically about the nature of knowledge, and about the ways in which knowledge is produced and validated' (Jones *et al.*, 1999, 350). This ability is crucial because in ESD pupils and students will not be able to retreat, as it were, onto the familiar and safe territory of any discipline they might study. They will have to become confident in inter- and transdisciplinarity, in assessing processes and solutions which take their elements from many different disciplines, for example when they learn to clarify 'the nature of the ideological and economic forces that are perpetuating the domination of the South by the North' or to revitalize 'non-commodified forms of knowledge, skills, and activities' in order to enable 'them to participate in mentoring relationships that will develop their talents and interests, and to experience other community-centered non-monetized relationships and activities that will develop a sense of responsibility for the well-being of the community' (Bowers, 2003, 18).

22 ***Experiential Learning: Reconnecting to reality***: education has become ever more specialised and theoretical, far removed from the messiness of real life. ESD will therefore have to try to find real life problems and actual experiences as learning situations to avoid the kind of reductionist 'solutions' which we have witnessed since the Industrial Revolution (for examples, see Jucker, 2002, 296-297). 'Experiential learning is based in messy reality, with all its paradox and untidiness, its ever-changing pattern, its refusal to conform to our expectations. As such, it inevitably leads to humility.' (Norberg-Hodge, 2000, 190)

23 ***Reconnecting to a sense of place***: On the one hand, the last thirty years of environmental education have shown that lecturing to pupils and students does indeed increase environmental awareness, but unfortunately this awareness does not automatically translate into sustainable action. On the other hand, it has equally been shown that change *does* take place if the fundamental values held by people are in tune with justice and sustainability. Only if you know something, love it, have an interest in it and develop responsibility towards it, will you care for it (for example the local beach or environmental justice for disadvantaged peoples) (see Jucker, 2002, 259-269). If we therefore want students to *act* sustainably, rather than turn into highly informed cynics, 'we need to confront the fact that young people and adults are increasingly being isolated from direct contact with nature.' (Plant, 1998, 17) ESD will need to reconnect them with nature and the real world, and develop their sense of belonging to a place and community.

24 ***Empowerment of the learner***: If we are serious about the empowerment aspect of sustainability (i.e. that people everywhere should be (re-)enabled to take control over all aspects of their lives), that surely needs to be reflected in the pedagogical approaches and apply to students as well. The teacher's role should therefore be to act as 'a catalyst for the discussion and re-evaluation of human values and practices, not simply to pass on

extant "naturalised" knowledge.' (Plant, 1998, vii) This means that the 'ownership of the knowledge' should not be exclusively with the teacher. Indeed, students should be given the 'opportunity to participate in the construction and transformation of the study materials in ways that are meaningful in the particular socio-political contexts in which they live and work.' (Plant, 1998, 110)

25 *Learning for action*: If the above analysis is correct that a) we need to move towards sustainability, and b) our current situation is unsustainable, any learning that doesn't lead to individual behavioural and therefore social change is not successful. Yet this social change cannot be prescribed: ESD should develop the capacity for change, rather than imposing a particular type of change on pupils or students.

26 *Systemic learning*: To approach sustainable education, Sterling has shown that we need 'a *third* learning level', namely 'transformative learning or epistemic learning' (2004, 55). This refers both to the fact that we need to learn to see things differently, i.e. as whole systems, rather than in a reductionist way, and to the necessity to develop enough reflective distance to understand how the whole system works.

Re-inforcing the message

27 *Change shadow curricula of society*: In view of the overwhelming dominance which the unsustainable paradigms of Euro-American society have over much of the globe, educators and students will have to work not just on isolated change within individual academic courses, but in the wider context of their lives. The shadow curricula of the media, the economic imperative, the political structure and many of the national and international institutions are preaching everyday unsustainable messages of 'growth', 'liberal democracy', 'scientific progress', 'development' and the like. These curricula have to be fought and counteracted through active sustainable citizenship by both educators and students.

28 *Institutional greening*: One of the key requirements for EfS is to 'promote a whole institution approach to environmental practice.' (Howard *et al.*, 2000, 84) Anthony Cortese from *Second Nature* emphasised that 'Higher education must "practice what it preaches" and make sustainability an integral part of operations, purchasing and investments, and tie these efforts to the formal curriculum. The university is a microcosm of the larger community. Therefore, the manner in which it carries out its daily activities is an important demonstration of ways to achieve environmentally responsible living and to reinforce desired values and behaviours in the whole community.'

29 *Appropriate architecture, learning atmosphere and culture*: However, it is not enough to introduce an energy saving regime and recycle wastepaper, however important that may be. We have to consider the entire environment within which learning takes place, in other words we have to check how much our lecture halls, seminar rooms, libraries, malls, student buildings, cafés and computer rooms fulfil sustainability criteria (see Orr, 1994, 104).

Sustainability Connections to Subject Centre disciplinary areas

30 Some examples of sustainability connections within particular subject areas are given below. The list is not exhaustive, and is intended to stimulate thoughts about how particular subject areas could be connected with sustainability. Add or substitute your own particular phrases where you feel it appropriate.

- sustainability and tutors' + students' lifestyles: analysis of personal practices

- biodiversity (habitats, species, and within species diversity) in relation to subject area

- climate change, and possible effects

- intergenerational equity or justice and what it implies about the way our disciplinary area is conducted now

- arguments around **inter**generational equity and **intra**generational equity;

- linkages of sustainability to HEI institutional management (e.g. does the institution have an environmental management system, if not, why not and/or what would it do?)

- Sustainable Management Systems versus Environmental Management Systems

- linkages of sustainability to research areas

- linkages of sustainability to future employment concerns of students

- Corporate Social Responsibility (C-S-R) and sustainability

- dematerialisation and carbon budgets

- quantification and efficiency of products/processes

- systems thinking and sustainability

- local distinctiveness, local sustainability

- bioregionalism and local 'stakeholder' involvement

- globalisaton and localization, including global inequality and North-South trade

- the meaning of 'sustainability': disputes over its ethics, political and commercial manipulation, and rhetoric ('greenwashing')

- food supply, food miles and sustainability

- techniques of 'backcasting' and 'forecasting', visioning and future studies in sustainability

- historical investigations of adoptions and origins of sustainability policy nationally and internationally

- 'industrial ecology' (=companies interrelating to reduce resource use)

- financial and resource savings via sustainability

- how to measure and monitor sustainability? Use of indicators, life cycle assessment, 'footprints'?

- sustainable tourism versus unsustainable.

- urban and/or/versus rural sustainability

- from 'built in obsolescence' to green marketing

- national systems of accounting: GDP (Gross Domestic Product) versus ISEW (Index of Sustainable Economic Welfare)

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Appendix 3: Orientation of four Subject Areas to ESD Curriculum

Twenty-seven curriculum areas were used as a tool to assess the different orientation of Subject Centres and Emerging Best Practice models to sustainability as a subject. Here, an illustrative analysis is shown between subject areas compared: Engineering, English, Environmental Science and Philosophical and Religious Studies (PRS).

Key:

*Taken from Subject Centre Focus Groups
+Taken from an interview with the Subject Centre manager
±This originated from a suggestion made from the Emerging Best Practice model *MSc Education for Sustainability*
†Taken from Emerging Good Practice examples
‡Generally originated from one subject area, hence not applicable [N/A] to the others
Notes are those of respondents except where summarised. These are in square brackets [].
 Respondents could score the following: 0 = no connection; * = connection; ** = strong connection; *** = very strong content.

	Subject Area			
Sustainability Content Criterion	**Engineering***	**English†**	**Environmental Science†**	**PRS**
ADDITIONS‡:				
28. 'Holistic' approaches towards projects/initiatives	***	N/A	N/A	N/A
29. Consumption and production	***	N/A	N/A	N/A
30. Consideration of consumerist versus environmentalist systems of belief and representation	N/A	***	N/A	N/A
31. Pleasure/pain	N/A	***	N/A	[applicable?]
32. Emotional reaction to environmental threats	N/A	***	N/A	**
33. Love of particular places, landscapes, animals, etc.	N/A	***	N/A	**
34. Problem of claiming anything to be 'objectively real' as against cultural relativism and constructionism	N/A	***	N/A	**
35. A training in evolutionary theory$^±$ (Darwinism etc.), and ecosystemic change and its implications for such factors as intergenerational equity	N/A	***	N/A	N/A [N.B. However, religious beliefs often clash with evolutionary theory. An area of interest.]

ORIGINAL LIST:				
1. Sustainability and tutors' + students' lifestyles: analysis of personal practices	*** [planned]	** [planned]	*	* perhaps philosophical reasons for behaving in a certain way would involve looking at life
2.Biodiversity (habitats, species, and within species diversity) in relation to subject area	** or 0? [implying not applicable]	*** teaching of 'extinction literature'; looks at a range of novels, poems and non-fiction texts that treat environmental issues	***	*** looking critically at the concepts and representations of nature: the way in which the term carries certain assumptions
3. Climate change, and possible effects	**	0	***	** looking at media and media interpretation [of climate change]
4. Intergenerational equity or justice and what it implies about the way our disciplinary area is conducted now	** [equated to] trends in analysis and future planning	0	** it is coming in now, as an inherent strand	*** examining morals and ethics
5. Arguments around **inter**generational equity and **intra**generational equity	** Engineers would have difficulty with some terminology	** post-colonial literature	** modules in development and globalisation	*** religion and development; philosophical debates about equity, justice
6. Integration of social, economic and environmental factors	*** e.g. DEFRA	* Marxist tradition	**	** this is a bit stark; ethics and religious responses to global economic systems
7. Linkages of sustainability to HEI institutional management (e.g. does the institution have an environmental management system, if not, why not and/or what would it do?)	[Noted that there are initiatives going on. No connection made at this stage]	0	**	0 not currently
8. Sustainable Management Systems (SMSs) versus Environmental Management Systems (EMSs)	*** CIWEM, DEFRA, NEBOSH [Another commented:] only through guest	0	* SMS a bit ahead of where industries are; specific within	0

	lecturers		environmental management module	
9. Linkages of sustainability to research areas	*** strong in recent NERC and DEFRA funded research	*	*	* definitely
10. Corporate Social Responsibility (C-S-R) and sustainability	** CIWEM and NEBOSH	0	* not an inherent part of course; it is talked about	** ethical debates
11. Dematerialisation and carbon budgets	* briefly mentioned	0	0	0
12. Quantification and efficiency of products/processes (eco-efficiency)	** CIWEM courses Strong interest from students	0	0	0
13. Systems thinking and sustainability	*	* some discussion of 'ecosystem'	* it is there; systems thinking is a bit historical	* ethical dimensions
14. Local distinctiveness, local sustainability	0 - no strong messages -not applicable	** literature of place and region	**	*** on philosophy and sustainability plus religious studies
15. Bioregionalism and local 'stakeholder' involvement	* CIWEM course	0	***	*** [see above]
16. Globalisation and localisation, including global inequality and North-South trade	* contextual intro. to modules	* Post-colonial theory	*** globalisaton modules	*** this would have large potential in sustainable development courses
17. The meaning of 'sustainability': disputes over its ethics, political and commercial manipulation, and rhetoric ('greenwashing')	** CIWEM course -contextual intro. to modules	0	* some students are receptive / aware of potential manipulation	*** would be substantial in sustainable development course
18. Food supply, food miles and sustainability	* used as a demonstration measure	0	** we role play [mostly] outside the curriculum	0
19. Techniques of 'backcasting' and 'forecasting', visioning and future studies in sustainability	0 not applicable	** literature that imagines the future:	0	0

		utopian and apocalyptic		
20. Historical investigations of adoptions and origins of sustainability policy nationally and internationally	0 Not applicable. More links to international policy directives	0	***	0 would be critical of assumed resource use, etc.
21. 'Industrial ecology' (=companies interrelating to reduce resource use)	* not explicit, only mentioned	0	*	0
22. Financial and resource savings via sustainability	** recycled road materials Life Cycle Analysis (LCA)	0	0	0
23. How to measure and monitor sustainability? Use of indicators, life cycle assessment, 'footprints'?	*** Life Cycle Analysis (LCA)	0	**	* little relevance, possible critiques of Ecological Footprinting
24. Sustainable tourism versus unsustainable	0 Not applicable	** analysis of narrative viewpoints using the tourists 'gaze'	*** just about to launch a new course	* all of these arising as examples
25. Urban and/or/versus rural sustainability	0 Not applicable	*** analysis of the pastoral	***	* [see above]
26. From 'built in obsolescence' to green marketing	*** sustainable design research	0	*	0
27. National systems of accounting: GDP (Gross Domestic Product) versus ISEW (Index of Sustainable Economic Welfare)	* cost engineering Only in the context of accounting for engineers	0	0	0

Appendix 4: Orientation of seven Subject Centres to ESD Teaching Approaches

(1) The Personal: Teachers as Role Models:

No.:	(1-2)	(3-4)	(5)	(6)	(7)
Focus Group:	ICS + MSOR	Engineering + UKCME	LLAS[20]	English	GEES
Positives	● applied maths could be working here ● belief, enthusiasm … plus 'acceptable norms' are + or - factors here]	● Strong need to demonstrate [this]. It is a key competence, ethical … and [could be used as a basis for job description]	● Adresses 'objectivity', confidence [building] ● teachers as language learners provide Model for learners	● Tutors are troubled by their own carbon [dioxide] emissions and their plane flights. … 'how much do you know about your local environment?' [could be asked]	● Passion provokes student interest. ● HE education cannot be value-free
Negatives	● 'I am a crank'; possible prejudice; ● not everyone will subscribe; needs a champion to promote (all) students buy in	● [Ordinarily care is taken] not to give a personal viewpoint. Engineers tend to see in 'black and white' and [often cannot integrate the] social	● preaching', values assessed? ● intimacy	[none]	● Should not promote a particular lifestyle (morally indefensible) ● Try not to preach
Would use or not?	Yes	Yes	Widely used, not yet in ESD context	Yes	Yes

(2) The Personal: Teachers as Learners / Learners as Teachers:

Focus Group:	ICS + MSOR	Engineering + UKCME	LLAS	English	GEES
Positives	● Authent-ic; relevant; ownership ●Examples: placement; student led seminars	● [Implies] the more constructive involvement of students	● loss of control FUN	● We would be doing this anyway, e.g. seminar work, and approve of it.	● [Strongly approve of this concept] apply knowledge [and] broaden experience
Negatives	● little use for project work or group work	● Personal beliefs introduce a bias	● loss of control SCARY, institutional frustration	[none]	● Obstacles: students' mindsets and expectations
Would use or not?	Yes	Yes / Unsure	[uninterpretable]	Yes	Yes (strongly in some cases)

(3) The Personal: Lifelong Learning:

Focus Group:	ICS + MSOR	Engineering UKCME	LLAS	English	GEES
Positives	● Link to other (professional) CPD	[none]	● Relationship ● Small groups, personal transformation, commitment	● We have large numbers of mature students doing our courses and reinforce our courses through public events, e.g. George Monbiot and Richard Mabey.	● Trying to engender independent learning ('don't give me fish, teach me how to fish')
Negatives	● minimal culture of CPD, except as applied to subject knowledge [within the mathematics area]; [may be perceived as] woolly	● Not used currently [therefore, by implication, impossible?] ● No teaching of CPD [currently]	● Counter-culture, climate of languages	● English courses traditionally assert different value systems from the purely commercial. However, once students hit the outside world it can be difficult. ● With few exceptions, the Russell Group / Ivy League universities have not connected with Eco-criticism. It has been left to the new universities.	● Dislike wording: indoctrination, implications of reinforcement
Would use or not?	Yes	Yes/No (undecided)	Yes [?] 'Frontline. Thinking'.	Yes	Yes/No (undecided)

(4) Re-connecting to Reality: Local Communities:

Focus Group:	ICS + MSOR	Engineering UKCME	LLAS	English	GEES
Positives	● [It will, by implication:] Keep students in the region	● Opportunities for case-studies, field trips and work-based problems	● Real / Vitality-sending. Exotic. Erotic.	**[General]** ● Probably very little is done. Should be more. It is not easy to see how English could connect. It is more a subject of the head	● Good learning opportunities / break down barriers ● Relates to … 'thinking globally, acting locally'
Negatives	● finance and support; resourcing time	● Resource to set up / support; location; don't have time to do it	● Variety. Ethics forms	**[See above]**	[None]
Would use or not?	Yes	Yes	[not determined]	Not sure how could be used	Yes

(5) Re-connecting to Reality: Real-life experiences:

Focus Group:	ICS + MSOR	Engineering UKCME	LLAS	English	GEES
Positives	● opportunities in applied mathematics, e.g. home heating optimisation	● Apply knowledge and sense of reality to problem-solving ● [Engineers are:] 'Practical people', [used to messy realities], is done via visits etc.	● Year abroad: experiential ● Experiential. languages	● In the Creative Writing course quite a lot is based on personal experience	● Multi-sensory learning, real life issues to grapple with ● Grounded learning

Negatives	● finance and support; resourcing time	● Tendency to date	● Bad experience… reinforce stereotypes ● Exposure and money	● Connecting a student's experience with what they have read in a book would be frowned upon, as encouraging self-indulgent subjectivity.	● [check]
Would use or not?	Yes	Yes	[Not determined]	Possibly	Yes [implication is very much so]

(6) Re-connecting to Reality: Connecting with People and Nature:

Focus Group:	ICS + MSOR	Engineering UKCME	LLAS	English	GEES
Positives	● IT infrastructure reduces waste; e.g. digital versus paper; e.g. virtual versus physical	[none]	● Become member of other community	● [Field trips are common] But: the analysis must get beyond the platitudinous. It must get students to look at the way in which (for example) animals are looked at; it must examine the intellectual framing	● Field trips help this. Can be valuable
Negatives	● no ethos of group / project work; potential for inter-disciplinary work; bio-mathematics	● Social and global aspects [are often dealt with] poorly [in engineering]	[none]	[none]	● Nature' - whose nature / how defined?
Would use or not?	Yes	Would try / unsure	Possibly	Already being used, via field trips and critiques of them	Yes [Strong approvals]

(7) Re-connecting to reality: Enacting Social Change:

Focus Group:	ICS + MSOR	Engineering UKCME	LLAS	English	GEES
Positives	● Examples: Decision Support Systems, e.g. not just finance-based; global issues; raised awareness of cultural and religious diversity	● Engineers look at change, therefore comfortable with this approach ● Free-thinking; belief; nice to have but [possibly problematic]	● learning a language necessitates change	● Aiming for student change is normal practice in English (cf. feminist/Marxist approaches to the subject). Therefore, aiming for change in attitudes towards the environment is just as legitimate ● A minority of students will always make the connection.	● All are agreed [this is needed]
Negatives	● realisation not there yet	● Time? Skills? Can it be assessed? ● Meeting constraints in the real world [hit the real world: can result in disillusionment]	[Not identified]	● There is a key problem: potential apathy of students combined with the enormity of environmental problems.	● No. Pushing a view ● need to reflect on why important [re-phrase as] 'capacity for empowerment'?
Would use or not?	Yes	Yes [via] role-play / unsure	[Not identified]	Aiming for change is legitimate part of English	Yes / No (undecided)

(8) Links with HEI SMS/EMS:

Focus Group:	ICS + MSOR	Engineering UKCME	LLAS	English	GEES
Positives	● already happening; will improve exponentially with awareness	● Vital: need SD into university values and teaching value ● The 'facilities' EMS is not linked into teaching [by analogy with a factory, EMS goes into operations, not into products and services] ● Case-study	[none]	● [To take the example of host University] there is a long-running dispute about the management of the site itself. There is a little strip of former meadowland which is used by a biology lecturer. Overall, there is not much time to go out and look at nature. The Director is sympathetic to environmental issues on the estate.	● university as community
Negatives	● Yes: but [by implication, it is:] more generic, less specific to ICS	● Demotivator if not sustainable in the long-term (or no system at all)	● Can be tokenistic or short-lived ● Outside Subject Centre curriculum	● Difficult to see direct connections between English and Eco-critical work and utilitarian aspects of Environmental Management Systems (EMSs), e.g. materials recycling etc.	● Supports 'weaselism' [e.g. HEI: EMS/SMS present, therefore no … action needed]
Would use or not?	Yes, but it is a broader concept	No / not really happening	[Not determined]	Possibly links could be made	Possibly: 'Hard slog'

(9) Interdisciplinary and critical thinking:

Focus Group:	ICS + MSOR	Engineering UKCME	LLAS	English	GEES
Positives	● central to ICS disciplines; favoured by industry / employers ● [this is inherently] part of being a mathematician, e.g. a 'natural', sought after [skill from] graduates [in e.g.] problem-solving	● Yes [large positive for this area]	● Critical thinking: viewing own culture from a distance	● Critical thinking: the subject is defined by this. The link between Eco-criticism and Creative Writing is strong. Interdisciplinarity elsewhere [in subject terms] is inherently difficult. C.T. is defined here as: getting people to be accountable for their own intellectual viewpoints, and to make connections	● [General agreement that holistic thinking is important] ● Yes, very valuable ● Gaia?
Negatives	● students don't understand; university infrastructure does not support	● Need for an holistic approach [implies complex thinking]	● Institutional gatekeeping	●Interdisciplinarity within HE is limited [by finance]. Also, interdisciplinary projects are vulnerable to being closed down. In addition, discrete forms of expertise militate against [it]	● Barriers - funding and institutional, students discouraged ● Politically sensitive
Would use or not?	Yes	Yes (but little done)	[Not determined]	[Already involved?]	Yes

(10) Systems thinking:

Focus Group:	ICS + MSOR	Engineering UKCME	LLAS	English	GEES
Positives	● key subject skill; key employability skill ●Examples: X-disc projects (difficult to achieve)	● Systems [thinking] is basic [requirement] in engineering	[None]	●Feminist and Marxist critiques always connect with politics, so students are aware of systems at some level. [However, they might be naive about biological systems and therefore make connections less easily]	● Can address different styles of learning ● [Affirmed as useful]
Negatives	● needs reinforcement [to] move out of 'comfort zone'	● [systems are not broadly interpreted to] include culture	● management speak	● Don't particularly like the term 'systems': it sounds mechanistic and utilitarian. Systems thinking would be (largely) alien to students [tend to be scientifically naive]	[none]
Would use or not?	Yes	Yes	[Not determined]	Perhaps, provided reinforcement of students with evolutionary theory were possible	Yes

(11) Respect/sensitivity for all subject areas

Focus Group:	ICS + MSOR	Engineering UKCME	LLAS	English	GEES
Positives	● should be central to the discipline; [it is an] employability skill	● [Affirmation given]	[Not determined]	● English -more than any other subject- has a soft sense of its own boundaries. It connects with all sorts of other subjects - especially post 1970s	● Useful focus for sustainable development … Needs work at the boundaries of disciplines
Negatives	● required changes in disciplinary boundaries; some students struggle with relevance of social issues to ICS	● Boundaries; culture; one subject seen as 'expert'	[Not determined]	● Students come here to study subjects. Perhaps what is needed therefore is respect for a subject's autonomy	● [none]
Would use or not?	Yes	Perhaps	[Not determined]	[Not determined]	Yes

Appendix 5: Scope of Literature Review

113 Subject orientated papers and monographs were primarily sourced from:

1. The *International Journal of Sustainability in Higher Education* from Vol. 1 Part 1 (2000) to Vol. 6 Part 1 (2005).
2. *Environmental Education Research,* Vol. 7 (2001) to Vol. 10 (2004)
3. The *Environmental Agenda Series (Promoting Sustainable Practice Through Higher Education Curricula)* (Pluto Press, 1994/1995) (9 short subject-orientated monographs, arising out of seminars held within HE, in the 1990s).
4. Two edited ESD-curricula-oriented volumes in the *Environmental Education, Communication and Sustainability* series:
    i. Leal Filho, W. (ed.) (2000). *Communicating Sustainability (Vol. 8)*. Peter Lang, Frankfurt. [31 chapters.]
    ii. Leal Filho, W. (ed.) (2002). *Teaching Sustainability at Universities: Towards Currriculum Greening (Vol. 11)*. Peter Lang, Frankfurt. [31 chapters.]
5. Recent monographs were also consulted:
    i. Sterling, S.(2001). *Sustainable Education: Re-visioning Learning and Change. Schumacher Briefings 6*. Green Books, Dartington.
    ii. Jucker, R.(2002). *Our Common Illiteracy: Education as if the Earth and People Mattered. Environmental Education, Communication and Sustainability series*. Volume 10. Peter Lang, Frankfurt.
    iii. Scott, W. and Gough, S.(editors) (2003). *Sustainable Development and Learning: Framing the Issues*. RoutledgeFalmer, London.
    iv. Scott, W. and Gough, S.(editors) (2004). *Key Issues in Sustainable Development and Learning: A Critical Review*. RoutledgeFalmer, London.
    v. Corcoran, P.B. and Wals, A.E.J.(2004). *Higher Education and the Challenge of Sustainability: Problematics, Promise, and Practice.* Kluwer, Dordrecht.
    vi. Blewitt, J. and Cullingford, C.(editors)(2004). *The Sustainable Curriculum: The Challenge for Higher Education*. Earthscan, London. [Consulted during report finalisation].

Appendix 6: Questionnaire Returns

Questionnaire returns were received from 12 Subject Centres, normally filled out by the Subject Centre managers. A thirteenth returned their questionnaire in time for some results to be incorporated.

Subject Centre	Date of Receipt
1. Bioscience	3.05
2. Built Environment (CEBE)	3.05
3. Economics	6.05
4. Engineering	3.05
5. English	5.05
6. Geography, Earth and Environmental Sciences GEES	3.05
7. Hospitality, Leisure, Sport and Tourism	5.05
8. Languages, Linguistics and Area Studies (LLAS)	5.05
9. Performing Arts (PALATINE)	3.05
10. Philosophical and Religious Studies (PRS)	3.05
11. Psychology	3.05
12. Sociology, Anthropology and Politics (C-SAP)	3.05
13. Art, Design and Media	Late 6.05: some results incorporated

Appendix 7: Subject Centre Focus Group Meetings

The following were facilitated. In some cases, the Subject Centre led the event, in others, the researchers (Gerald Dawe (GD) or Rolf Jucker (RJ)) were able to facilitate proceedings. In some cases joint facilitation occurred. In all cases, productive information was obtained. Focus Groups normally consisted of the Subject Centre managers and several practitioners from relevant disciplines.

Subject Centre	No. of SCs present	Approx. Nos. Attending	Facilitated By	Date and Place Held
Economics	1	6	Subject Centre[21]	11.4.05 Univ. West England
Engineering and The Centre for Materials Education UKCME)	2	10	Researchers (GD)	8.4.05 Univ. Loughborough
English	1	3	Subject Centre / Researchers (GD)	16.4.05 Univ. Coll. Bath Spa
Geography, Earth and Environmental Sciences (GEES)	1	20	Subject Centre / Researchers (GD)	26.4.05 CREATE Centre, Bristol
Information and Computer Sciences (ICS) and Maths, Stats and OR (MSOR)	2	10	Researchers (GD)	21.3.05 Univ. Birmingham
Languages, Linguistics and Area Studies (LLAS)	1	15	Researchers (RJ)	15.4.05 CILT, London
Performing Arts (PALATINE)	1	[Not applicable]	[Event cancelled due to short timescale: SC Manager / Coordinator interviewed]	[Not applicable]
Philosophical and Religious Studies (PRS)	1	[Not applicable]	[Event cancelled due to short timescale: SC Manager / Coordinator interviewed]	[Not applicable]

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[21] This was one of eight meetings around the country facilitated by the Economics Subject Centre. They were centred on barriers and solutions, and did not include teaching methods and definitions. Twenty - five participants were involved overall.

Appendix 8: Emerging Good Practice

The models of Emerging Good Practice have been divided into Undergraduate and Postgraduate. The first two are included in the text, and the others are here.

Contents to Emerging Good Practice:

Undergraduate
1. *Embedding Education for Global Citizenship and Sustainable Development (EGCSD) in Initial Teacher Education and Training Courses* Sheila Bennell, University of Wales, Bangor.
2. *BSc Environmental Science/BSc Environmental Management / BSc and BA Environmental Studies* Ros Taylor, Kingston University.
3. *Representations of Spirit, Body and Beast* Sally and Mike Alsford, University of Greenwich.
4. *Writing and Environmental Crisis* Richard Kerridge and Greg Garrard, Bath Spa University College.
5. *Business, Environment and Sustainability (lecture)* Nicola Corrigan, University of Hertfordshire.

Postgraduate
6. *MSc Education for Sustainability* Jenneth Parker and Ros Wade, London South Bank University.
7. *Master of Business Administration (MBA) (Sustainable Business Development)* Alistair Allen, Nottingham Trent University.
8. *Sustainability and the Built Environment (module)* Jacqui Glass, Loughborough University.

Vignette: BSc Environmental Science, BSc Environmental Management, BSc/BA Environmental Studies

Course outline: Sustainable development can, in very many ways, be regarded as being an inherent part of geography or environmental sciences. As the subject area –sustainability- has developed practically and politically, so various elements have been incorporated into course modules. Despite the important emphasis on 'science', and taking a dispassionate view of nature, the degrees also emphasise ethical, cultural, practical managerial, and human geographical approaches towards dealing with environmental issues. For example, there are modules which concern the adoption of Sustainability Management Systems (SMSs) and Environmental Management Systems (EMSs) by the private sector. There are also sections which deal with considering human beings simply as one species among many, and the ethical arguments associated with this stance. The use of role-play and experiential learning is also key to the course.

Teaching approaches: Concerning educators as role models, students and lecturers should relate on an equal footing, and the complexities of peoples' lives need also to be taken into account. It is probably important not to adopt a 'missionary' approach towards inculcating students with a sustainability ethos. However, in many situations, the system, institutionally and socially, is operating against sustainability, and this needs to be recognised. This tutor believes in 'active learning', by both students and tutors, via workshops and role-plays. However, it is important to ensure that some students are not disadvantaged by it: everyone needs to be given equal opportunities to succeed. Regarding local communities, a placement scheme operates, together with a work shadowing scheme, just started from this year. A further important point is that links with the local community give useful contacts who can be invited into the university. Finally, by being involved with the locality, students can actually see the realities of what they are being taught about. Regarding connections to nature, we are all part of the ecosystem, and do not have any (moral) dominance over it. Hence, considering the equality of organisms (as species) is important. Concerning the idea of creating student activists, there may be dangers here, of indoctrination, which this tutor is wholly against. In other words, the arguments and the debates need to be presented, to allow students to choose which path they wish to follow. There is a definite synergy between institutional Environmental Management Systems (EMSs) or environmental policy and practice, and delivery of the course at Kingston University. To give examples, successful links have already been made between materials recycling, energy etc., both as student projects and concerning the reality of what the HEI actually does. Inter-disciplinarity and critical thinking, together with systems thinking are at the heart of environmental science and geography, and these courses.

Content/connections: There are very strong connections with: biodiversity; climate change; integration of social, economic and environmental factors; bioregionalism and local stakeholder involvement; globalisation and localisation, including global inequality and North-South trade; historical investigations of adoptions and origins of sustainability policy nationally and internationally; sustainable tourism versus unsustainable; and urban and/or versus rural sustainability. Of the other issues outlined, intergenerational equity; linkages to HEI institutional management; systems thinking and sustainability; local distinctiveness, local sustainability; food supply, food miles and sustainability; and how to measure and monitor sustainability; use of indicators, life cycle assessment, 'footprints' also exhibit strong connections, though slightly less pronounced than the above factors, and in some cases, for example, intergenerational equity, they are likely to grow further in importance.

Course Director: Ros Taylor
HEI: Kingston University
Faculty/School: Faculty of Science, School of Earth Sciences and Geography
Internet: www.kingston.ac.uk/esg

Vignette: **Writing and Environmental Crisis**
[Part of BA English]

Course outline: The course uses the concept of Eco-criticism as its core. Eco-criticism as a topic is essentially a materialist exploration of nature as it exists now, contrasted with representations of nature in literature, both contemporary, and historical. In some ways it can be regarded as an extension of Marxist analysis. It has challenged traditional literary canons, by wishing to include nature (e.g. often non-fiction) books in the topic, as legitimate areas to work on. To take an example from fiction, Thomas Hardy, in his *Return of the Native,* wrote about Egdon Heath. Is the Heath on which he based the story still there? Does it endure, as was implied in the book? Or has it disappeared? Jonathan Bate has written of swallows in poems, and are they there now, in reality? These are the sort of issues tackled by this teaching tradition.

Teaching approaches: With regard to educators as role models, we see no problem with something which is ethically prescriptive, as for example, feminist or Marxist approaches are. With regard to real-life experiences much is based on students' personal experience. However, connecting students' experience with books they have been reading is not often used in English and would be criticised as encouraging self-indulgent subjectivity. However, it does have some potential. We connect with nature via regional field trips contrasted with a walk around the local woods. Here, the objective is to get beyond the platitudinous, and to get students to think about the way they look at animals, or the intellectual framing. Regarding getting students to enact social change there is the problem of (student) apathy combined with the magnitude of the world's environmental problems. However, a minority of students will always make the connection. Concerning interdisciplinarity and critical thinking the subject defines itself by advancing critical thinking (defined here as getting people to be accountable for their own intellectual viewpoints). However, interdisciplinarity is more difficult: it should be recognised that discrete forms of expertise militate against interdisciplinary work. Systems thinking, if it were linked with biological systems, would be largely alien to English students. In approaches allied to sustainability, for example feminist or Marxist thinking, students readily connect with the political, however, they may not easily connect with the ecological or biological. In fact, as a precondition for undertaking 'systems thinking' people should be taught about evolution and understand about Darwinism. Again, to give an example, some eco-critics have been regarded as being naive at least partly because of their lack of knowledge in this area. For example they may deal with animism or indigenous communities with an unquestioning approach.

Content/connections: There is a consideration of consumerist versus environmentalist systems of belief and representation at the heart of Eco-Criticism. There are strong concentrations on arguments around *inter*generational equity and *intra*generational equity, centred on post-colonial literature, and on local distinctiveness and local sustainability, based on literature of place and region. There is also perceived to be a (potentially) strong relationship between techniques of 'backcasting' and 'forecasting', visioning and future studies in sustainability via utopian and apocalyptic literature.

Course Directors: Richard Kerridge and Greg Garrard
HEI: Bath Spa University College
Faculty/School: School of English and Creative Studies.
Internet: www.bathspa.ac.uk/schools/english-and-creative-studies/

Vignette: **Business, Environment and Sustainability - Human Space and Society**
[Within BSc Hons Environmental Sciences and BSc Hons Geography]

Course outline: This example concerns a lecture contribution of Nicola Corrigan, the university's Environmental Coordinator, responsible for the implementation of the Environmental Management System (EMS), to the module. In it her aim is to get students to consider the following: considerations around social and ecological sustainability; to begin to understand factors around corporate social responsibility; to also understand the pressures for business to become sustainable; and finally, to understand the social, economic and environmental impact of an organization. Significantly, for the latter, the University of Hertfordshire is used as a case study.

Teaching approaches: Students observe that, from the position of Environmental Coordinator dealing with an EMS, people within an organisation can work to make sustainability a more likely reality, and ultimately to change peoples' behaviour. It also demonstrates that, via the use of this position, how the direction of environmental issues can be changed at the university. It may also inspire students to think about what they can achieve through their own lives and future careers. The lecture introduces ideas of corporate responsibility and asks students to participate in discussions, group work and presentations to develop their own ideas by relating issues to their own circumstances and interactions. This lecture takes place as part of an awareness programme which is integral to the implementation of the university's EMS. The aim of this is to ensure students are aware of environmental management issues at the university and beyond. The lecture outlines society's sustainability problems and relates these to issues around business Corporate Social Responsibility. It is important to outline global issues precisely so that students can make links at the local level through their own experiences of life and work within the HEI. Again, this lecture quite deliberately uses the University of Hertfordshire as a case study so that students can easily connect wider sustainability issues at a local level. Using this material enables them to identify and focus on problems, but also, significantly, enables them to offer innovative solutions as to how the university could improve its Corporate Social Responsibility (C-S-R) performance.

Content/connections: The lecture outlines the idea that human beings are indeed part of natural cycles. It also covers the principles of Ecological Footprinting. This helps students relate the need at both the personal, and at the HEI, level to operate within the limits of natural cycles. Secondly, it emphasises the need for respecting the Earth, to conserve resources and to eliminate waste production in order for society to survive. By students relating very much to their own experiences and asking them to supply solutions this builds capacity by making them connect with the consequences of their own actions. The university's EMS is an integral part of wider corporate responsibility issues and the university has implemented a number of measures to ensure sustainability is part of its business ethos. The university is working towards the ISO14001 EMS standard, which is concerned with 'continual improvement'. (The latter has to be an integral aspect of most EMSs, especially those accredited by the International Standards Organisation (ISO)). This lecture has been developed to be generic and interdisciplinary and may be delivered to students from different subject disciplines.

Course Director: Debbie Pearlman Hougie
HEI: University of Hertfordshire
Faculty / School: Life Sciences
Internet: School of Life Sciences: herts.ac.uk/environment; Environment Team: herts.ac.uk/sustainable

Vignette: MSc Education for Sustainability

Course outline: The course is called Education *for* Sustainability, because it is imparting a value system. The whole aim is to produce agents for change. Recruitment is mainly from teachers and FE lecturers, rather than HE at present. The programme is unique in exploring both environmental education and development education in the context of education for sustainability. It has been recognised internationally for its contribution to the field and has welcomed a rich diversity of students from many different regions and disciplines. Originally developed in collaboration with the World Wide Fund for Nature and supported by a range of environmental and development NGOs, this challenging and innovative programme deals with the theory and practice of environmental and development education, enabling explorations of the role that education for sustainable development can play in social, political and economic change. In 2001 the programme also received a rating of 23 out of 24 from the Quality Assessment Agency (QAA).

Teaching approaches: Teaching by example is key, it is not so much about role models, more about recognising the personal/political split. For example, some tutors like to maintain superiority by not exposing their own environmental slant or orientation, although such *exposure* might encourage some reflection on their own behaviour. Concerning real-life experiences we aim for quality education, taking where people are starting from into account. This is an Equal Opportunities issue, and at university policy level, there are issues concerned with creating effective local universities, e.g. through research centred on the community; in addition, some US universities' charters include an obligation to deliver locally. Contact with nature: this centres, for us, on what the university feels like, and is it, for example, implementing an effective Environmental Management System (EMS)? The university should be a resource to learn from. An EMS presents another opportunity for facilitating cross academic-estates-facilities management meetings, and the involvement of all employees in sustainable activities. Concerning enabling students to enact change – this is key, but, and this needs to be emphasised, *behavioural* change is not enough, it should be *societal* change that it is aimed for. Finally, it would be interesting to contrast critical thinking and systems thinking: often they are opposed. Furthermore the Western tradition of critical thinking is reductionist rather than synthetic and holistic. We are in favour of systems thinking and also, 'respect for all subject areas'. However, in the latter case, it is important not to be uncritical of some areas.

Content/connections: The introductory module outlines the relationship between education and society and consideration of the roles that development education and education for sustainability might play in educational and social change. The second module deals with processes and management of change using examples from the formal sector. This unit supports students in becoming effective agents for change. The third unit, values and participation, raises key questions around environmental and development policy and practice, including issues such as equality. The fourth unit, global issues and local action: focus on NGO education, looks at the dynamics of interaction between overarching global forces and small scale local actions in the context of education for sustainability. The fifth module aims to develop understanding of the theoretical and ideological frameworks underpinning environment, development, and sustainable development. It also explores their relationship in the context of globalisation. The sixth unit, science and culture in education for sustainability, discusses scientific and cultural forms of education, enquiring into their relationship to education for sustainability. The unit encourages students to develop interdisciplinary perspectives and plans for education for sustainability. The seventh module encourages students to draw on the studies so far, to develop views on the relationship between sustainable development and education for sustainability. There are opportunities to design an education for sustainability strategy or programme in students' areas of work within this. There is an additional module on research skills, and a dissertation around environmental and development education follows.

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HEI: London South Bank University
Faculty/School: Faculty of Arts and Human Science, Department of Education
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***Vignette:* Master of Business Administration (MBA) (Sustainable Business Development)**

Course outline: This is a conventional MBA which has been re-framed to emphasise and incorporate sustainable development.

Teaching approaches: Concerning educators as role models, enthusiasm, knowledge and conviction is important – however, the lecturer needs to be dispassionate. Proselytising and propaganda will not be appropriate: by self-reflection, the lecturer sets her/himself up to be, in effect, a 'coconut shy'. However, the induction module includes an earth systems/Ecological Footprint (EF) estimation exercise. Regarding teachers as learners/learners as teachers, we are absolutely committed to this: it is important. Lifelong learning: MBAs often recruit mature students, and they interact constantly with regional Small and Medium Enterprises (SMEs), so there are constant, lifelong relationships established via these interactions. Relationships with local communities are inherently strong: some of our regional funders are Non-Governmental Organisations (NGOs), others, the European Social Fund (ESF) and the East Midlands Development Agency (EMDA) so it is axiomatic that we are involved. To deal with real-life experiences, within the MBA there is a case-study orientation, involving two consultancy projects where students are placed within companies during the year. The first is based within the UK, the second is international in nature. There is a sustainable development tangent to the consultancies - in other words, it is *not* simply business placement. To give an example of our perception of relationships with nature, a planned marketing module is on a Scottish Island, in effect, this constitutes a closed ecosystem. One of the aims is that this should concentrate students' minds wonderfully on the challenges of living within this. We are also sensitive about the materials used during the course: For example, we have insisted on producing a brochure using soya-based inks, and are looking to get a hemp bag for the course (as opposed to something produced in plastic), and, finally, the course pen is made from algae. Regarding enacting social change –in general, we want to encourage people to change things, beyond their MBA. One could regard the business placements as involving, in a sense, radical activism, since the students are often involved in reorientating businesses towards sustainability. Concerning EMSs, we take their relevance very seriously: the Institute for Sustainable Development in Business (ISDB) is implementing ISO14001 (an EMS). Here, there are close links with the 'practice what you preach' outlook of the MBA. It is axiomatic that our MBA is about interdisciplinarity and critical thinking. This is a general feature of MBAs, since future managing directors are being trained on the course. Systems thinking are being carried through, in both practical and academic senses, via our Ecological Footprint (EF) audit and the EF-related island fieldwork. Finally, regarding 'respect for all subjects', we would argue that sometimes it is contention that is needed.

Content/connections: Very strong connections are noted within the course for the following: climate change, and possible effects; intergenerational equity; linkages of sustainability to HEI institutional management (e.g. an EMS is being developed, currently, within ISDB); quantification and efficiency of products/processes (eco-efficiency); local distinctiveness and local sustainability; 'industrial ecology' (= companies interrelating to reduce resource use); financial and resource savings via sustainability; and from 'built in obsolescence' to green marketing, the latter to include looking specifically at extending product lifecycles. There were also strong connections to biodiversity; integration of social, economic and environmental factors; linkages of sustainability to research areas; systems thinking; bioregionalism and local stakeholder involvement; and finally, the meaning of 'sustainability': disputes over its ethics, political and commercial manipulation, and rhetoric ('greenwashing'). The latter could be summed up, in terms of our MBA, in the phrase 'managing ethically'.

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Vignette: **Sustainability and the Built Environment**
[Within MSc Construction Project Management]

Course outline: The course is practical and applied, both by its very nature, and also, by the fact that it recruits from mature students who have already have been practitioners in the building industry. It aims to provide such students with the key competences they need to operate to high professional standards taking sustainability into account, within the area of the built environment.

Teaching approaches: The list of teaching approaches as provided was regarded as being very theoretical. To explain this further, in the context of the built environment, practical skills are key, and especially dealing with how theory is put into practice. Regarding teachers as learners/learners as teachers, this approach is strongly advocated for within the course. For example, students have a role-play exercise on waste management. This is a three-way role-play exercise, and involves them as designers, contractors and clients. They also have to present a talk on a specific sustainability topic, delivered to the group as if they were siteworkers. Students are also encouraged to bring their own 'live' examples, based on their own experience, to the course. Lifelong learning is, within this disciplinary area, effectively a devolved responsibility, enacted by the professional institutions which are very strong in this area. Regarding real-life experiences, arguably, everything about the course is dealing with a 'messy reality' and getting students to think about real-life situations. Concerning connecting with nature, the best connection students make is via a visit to a 'low-tech' environmentally-friendly building project, to become more familiar with the notion of sustainable building. Dealing with getting students to enact social change, here the aim is to develop 'in company' social activists, who will attend to the care of environmental and sustainability issues. There are definite connections here with the notion of EMSs, since concerning the on-campus work carried out; they are asked to make reference to Loughborough University's environmental strategy. Regarding interdisciplinarity and critical thinking, construction is a multi-disciplinary area, and education for sustainable development is simply a logical broadening out of this. Critical thinking skills are also regarded as being important. Systems thinking is touched on in two ways: (i) via the 'five capitals' model of sustainability; and (ii) via a specific workshop on stakeholder involvement. Finally, respect for all subjects, or broadening the thinking, is definitely an aim of the course.

Content/connections: Very strong connections were noted with: integration of social, economic and environmental factors; and how to measure and monitor sustainability; use of indicators, life cycle assessment, and 'footprints'. The latter was noted as being especially critical in built environment work. Other areas with strong connections were identified as: climate change, because energy used by the built environment in society is a critical issue, and assessment of energy used in materials also impacts on sustainability; linkages of sustainability to research areas; and quantification and efficiency of products/processes (eco-efficiency). The latter has a particular significance and there is, for example, a specific session on assessment methods for materials and buildings, and these use methodologies developed by the Building Research Establishment (BRE). Other areas with strong connections are: the meaning of 'sustainability': disputes over its ethics, political and commercial manipulation, and rhetoric ('greenwashing'). In the latter topic, the difference between environment and sustainability is explored, as well as the different interpretations given to the term by bodies, institutions, and companies. One other area which is a particular strength is historical investigations of adoptions and origins of sustainability policy nationally and internationally. This is again of key importance, as governmental policy is directly affecting what building materials can be used. Linking resource use with financial savings or even increased costs is an issue which may well expand in the future.

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Appendix 9: Barriers and Solutions to Embedding ESD

Barriers

Barriers reported on by Subject Centres, as evaluated from questionnaire returns sent in from either Subject Centre managers or directors, are reported on below:

	1 English	2 Lang., Ling., & Area Studies (LLAS)	3 Hosp., Leis., Sport & Tour.	4 Soc., Anthrop. & Politics (C-SAP)	5 Geography, Earth and Environmental Sciences (GEES)	6 Philos. & Relig. Studies (PRS)	7 Built Envt. (CEBE)	8 Engineering	9 Performing Arts (PALATINE)	10 Economics	
NEW BARRIERS:											**New barrier:**
Difficulty of translating ecological concepts into literary theoretical concepts (English SC); discourse within which the debate is framed (LLAS SC)	*	*									**1**
PREVIOUSLY REPORTED BARRIERS:											**Total barriers:**
Awkward fit with subject area		*							*		**2**
Perceived irrelevance by staff (and) Awkward fit with subject area	*	*	* esp. in Sport	the resource squeeze on all social science		*			*	*	**7**
Curriculum too crowded already and lack of time to update courses	*	*	*		*	*		*	*	*	**8**
Internal accreditation, validation systems, benchmarks				to some extent					*	*	**3**

Requirements of professional associations											**0**
Lack of staff expertise and the need to acquire new knowledge	*	*	*			*		*	*	*	**7**
Perceived irrelevance by students	*	*	* possibly in Sport			*			*	*	**6**
Inability of students to grasp the issues	*										**1**
Lack of institutional drive and commitment	*		distributed unevenly	*	*			*	*	*	**7**
Lack of staff awareness	*	*	*			*		*	*	*	**7**
Financial restrictions			yes	*	*				*	*	**5**
Confusion over what needs to be taught	*	*	possible					*	*	*	**6**
Lack of market for students											**0**
Lack of relevant course examples		*						*?		*	**3**
Reality of future career conflicts with sustainability teaching											**0**
Lack of perception of big environmental problems											**0**

Lack of academic rigor/misunderstanding								*		*	2
No barriers identified						*					1
TOTALS:	9	9	5	5	3	7	1	7	10	11	

Here, results of previous work are given:

Barriers	Kingston survey (Dawe, Gant and Taylor, 2003)	Jucker (2002)
No. of respondents	56	10
Total barrier score*	114	30
	%	%
Perceived irrelevance by staff and/or awkward fit with subject area	16	13
Curriculum too crowded already and lack of time to update courses	16	10
Internal accreditation, benchmarks, and/or requirements of professional associations	12	n/a
Lack of staff expertise and the need to acquire new knowledge	11	30
Perceived irrelevance by students and/or inability of students to grasp the issues	10	10
Lack of institutional drive and commitment	4	7
Lack of staff awareness	4	n/a
Financial restrictions	3	10
Confusion over what needs to be taught	3	3
Lack of market for students	3	n/a
Lack of relevant course examples	2	n/a
Reality of future career conflicts with sustainability teaching	2	n/a
Lack of perception of big environmental problems	2	n/a
Lack of academic rigour/misunderstanding	1	10
Other barriers/reasons for rejection/concern	8	7
No barriers identified	3	0
Total:	**100**	**100**

*Each respondent was permitted to cite more than one barrier; percentages are based on barrier scores.

Solutions

Solutions to overcoming the barriers are given below, from the Focus Groups and independent ESD Development Reports to the HEA.

Key:

*asterisked and **emboldened** text refers to a phrase added in by Subject Centre
Devt. Rept. = an ESD Development Report undertaken for the HEA. See Postscript, page 48.

Fundamental/political:	No. of SCs	Subject Centres
Sustainability has to be part of everybody's thinking: there must be a cultural shift	1	LLAS
Keep emphasising the importance and relevance of sustainability: it is a subject of the future not the past; **it needs support from the highest levels of the institution*; lack of top-level leadership, the Vice-Chancellor and infrastructure 'set the standard': therefore a business case/academic plan for ESD, via HEFCE/HEA is necessary*** Lobbying institutions and other bodies to include sustainable development in benchmarking*	6	LLAS, ICS and MSOR, Engineering and UKCME (Top priority), Economics
Universities are not currently set up to be 'commercially' focused in driving change [e.g. towards ESD]: they need to respond to demands from industry; and be able to shorten timescales [for delivery]*	2	Engineering and UKCME
Practical:		
There is too much on the 'big and grand', concentrate on the small and practical	1	LLAS
Economic incentives to recycle must be given	1	LLAS
Inform people about sustainability courses already existing elsewhere	2	LLAS, Economics
Sustainability should not be a 'bolt on'**: it should be integral to the subject*;**	3	LLAS, ICS and MSOR
Full integration needs to be encouraged: a failure to identify ways in which ESD may be integrated seems to be the case at the moment. There is a real danger of ESD being seen as something that is 'bolted on' to the curriculum*	1	LLAS (Devt. Rept.)
Delivery of ESD:		
Provide material which is adjusted or contextualised to current course content; **putting ESD into context, relevance and connectivity (e.g. there is a lack of acceptance of its importance)***	3	LLAS, Engineering and UKCME
Inform people about sustainability courses already existing elsewhere	1	LLAS
Care is necessary to ensure that students are not simply taught sustainability: **they must be involved in course delivery too***	1	LLAS
Engage professional bodies in delivery*; collaborative talking between p.b.s/institutions to give courses credibility*	4	ICS and MSOR, Engineering and UKCME, Economics
Secure finance and support*	2	ICS and MSOR
By being more creative, or by clever 'lateral thinking', sustainability can be included even in unlikely subject areas: **Don't try to teach 'sustainability' – foster critical thinking in relation to the concept***	1	LLAS
Research on performing cross-/inter-disciplinarity including assessment and management* Using case studies to share	3	ICS and MSOR, Economics

inter- and intra- disciplinary sharing of ideas, methods and materials		
Support from QAA benchmarking statements is needed*; the structure of the RAE needs to be changed*; lobbying by Subject Centre directors should be used to achieve this	**4**	ICS and MSOR, Psychology (Devt. Rept.), Economics
Provide quality teaching materials including case-studies; good learning opportunities break down barriers*	**4**	Engineering and UKCME, GEES, Economics
Outside/guest speakers*	**2**	Engineering and UKCME
Subject Specific solutions:		
Difficulty of reconciling 'broad' issues with specific, technical, engineering issues: solution, expand the 'human factors'	**2**	Engineering and UKCME
Teach Rhetoric plus creative writing, Bricolage*	**1**	LLAS
Lack of a clear concise definition, inhibits understanding of potential connections with SD*	**1**	MSOR (Devt. Rept.)
Students:		
Students need to be receptive to the underlying philosophy of sustainability; **make it relevant to the student body***	**3**	LLAS, ICS and MSOR
Include employability evidence of sustainability	**1**	Economics
Academic and Delivery Staff:		
Gain the support of a critical mass of staff within subject groupings / HEIs	**2**	ICS and MSOR
Deal only with motivated staff: this will aid the development of successful 'demonstration courses'; **foster the understanding of staff*; 'enable' the academic (via materials, knowledge, awareness)**	**5**	LLAS, ICS and MSOR, Engineering and UKCME
Sources of information/expertise are required*	**2**	Engineering and UKCME
Possibilities of staff development relevant to sustainability (e.g. short courses, seminars, conferences, exchanging case-study material, methods, etc.) need to be pursued to increase the likelihood of sustainability coming in to various subject areas; **Continuing Professional Development (CPD)/access to relevant events is required***	**4**	LLAS, Engineering and UKCME, Economics
Support (internal and external)*	**2**	Engineering and UKCME
Clarity (national?) syllabus*	**2**	Engineering and UKCME
Be aware that some academics will be too reductionist to deal with sustainability	**1**	LLAS
The cultural exclusion of the social dimension of my subject area is regrettable: it excludes the possibility of considering sustainability. This must be overcome	**1**	LLAS
Problem of 'time needed' to prepare what goes out: Remove material from courses and substitute ESD material; shared load? [possibilities may arise]	**2**	Engineering and UKCME (Second highest priority)
Change the roles of staff and redistribute them, year by year*	**2**	Engineering and UKCME
Create a directory of lecturers with a research interest in sustainability, as a means of neworking	**1**	Economics

Communication		
Personal networking will be more effective than a newsletter and/or the intranet	**1**	LLAS
Future ideals:		
Courses should be re-written in relation to the environment, rather than in relation to increasing student numbers and diminishing resources	**1**	LLAS
Courses should be longer to include sustainability and ensure technical adequacy	**1**	LLAS
Other:		
The word sustainability is a problem: this needs to be resolved	**1**	LLAS