

Learning and Skills for Sustainable Development

Developing a sustainability literate society

Guidance for
Higher Education
Institutions

“... the people who will succeed fifteen years from now, the countries which will succeed, are those which are most based on a sustainable vision of the world. That is what we should be training people to do.”

Rt Hon Charles Clarke MP, Secretary of State for Education and Skills, 25th March 2003.

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Foreword



We publish this guide with some humility. It has been very hard to draw together. Hard to do justice in anything less than the weightiest of tomes to the huge body of knowledge and experience in both the Education for Sustainable Development world as well as in that of pedagogy in general. And hard to be clear and unequivocal about what is essentially work in progress.

Forum for the Future has run a Leadership for Sustainable Development Masters for seven years and has been working with partners in the Higher Education Partnership for Sustainability on various projects around the curriculum over the last three years. This has been a rich learning experience and we wanted to communicate our learning in a format that would inspire others to experiment with what is actually a radically new approach to integrating sustainable development into a wide range of learning and skills programmes.

The approach we have developed stands firmly on widely accepted good practice for designing and running courses, and seeks to add value through integrating sustainability literacy or competencies, either through a fresh view of existing courses or through the design of new ones.

Some will be astonished that this guide contains no checklists for course contents, or for learning outcomes. That is because a lot of experience (by us and by others) tells us that the one size fits all approach to understanding sustainability just doesn't work. At least it doesn't work in a way that leads to changed behaviour.

Forum for the Future advocates a new way of thinking about sustainable development - as something that enables us to achieve our economic, social and environmental goals at the same time. For us, sustainable development is about working out how to apply that 'at-the-same-time-ness' to our decisions and actions wherever we end up. This guide applies that way of thinking about sustainable development to the design of courses.

This guide is work in progress. The Sustainable Development Action Plan published by the Department of Education and Skills in September 2003 is another work in progress that has given a welcome boost to the university as well as to other education sectors. Critically, the Department for Education and Skills has been inspired to act, as we have, by the growing evidence of the damage unsustainable development can cause to people and the environment.

I would like to take this opportunity to thank the many people who have contributed to our thinking over the past few years about how to integrate sustainability literacy into different sorts of courses. We have tried to acknowledge as many of those contributions in the guide as possible. We certainly look forward to continuing our work with you in the future and hope we will be joined by a host of others bent on the same mission – to accelerate change to a sustainable way of life.

A handwritten signature in black ink that reads "Sara Parkin". The signature is written in a cursive style and is underlined.

SARA PARKIN
Programme Director
Forum for the Future

Purpose of this publication

The purpose of this publication is to help higher education institutions to integrate sustainability literacy into the curriculum of their learning programmes. It is aimed primarily at those who have the responsibility for procuring, designing and delivering courses, although it can easily be adapted for a wider audience.

The approach and tools suggested in this guide have been developed and trialled through Forum for the Future's Higher Education Partnership for Sustainability programme (HEPS), both in the UK and abroad. They also draw on the experience developed by Forum for the Future through its own Leadership and Sustainable Development Masters and capacity building work with partners in the business sector elsewhere.

The first section discusses the express need to increase the number of higher education courses that include sustainability literacy as part of their desired learning outcomes. As society changes, so do its institutions. Higher education institutions are rethinking their purpose and modus operandi to ensure their relevance and value. New strategies and ways of delivering higher education are emerging, and some encouraging questions are beginning to be asked. Why is it crucial to include sustainable development as part of the future strategy of institutions? Why is it more sensible to include sustainable development into existing courses than to develop new specialist courses? What does sustainability literacy mean?

Section two provides a brief review of existing provision in learning and skills for sustainable development in higher education institutions and discusses five key principles for the development of sustainability literate graduates, based on research and relevant literature.

The main part of this guide – section three – explores some of the key elements of good practice in integrating sustainability literacy into the provision of all courses in the higher education sector, and proposes a tool kit to guide practitioners. Based on existing good practice, it provides useful tools to help course designers identify and prioritise sustainability elements in any existing or new courses.

This guide recognises that there is no set model to help course procurers, designers and deliverers integrate sustainability competencies into current provision. Our hope is that it will provide sufficient balance between direction and self-discovery to enable practitioners to feel sufficiently competent to get started, to learn through the use of these tools and to feel that they are on the right track.

This publication includes examples from our partners, others and from our own experience. The learning for us has been considerable and we have tried to provide as many acknowledgements as this short document can bear.

The Higher Education Partnership for Sustainability

This publication is one of the outputs of the Higher Education Partnership for Sustainability (HEPS). The HEPS is a three-year initiative established by Forum for the Future in the summer of 2000 and involves 18 universities and colleges from across the UK. HEPS is funded by the Higher Education Funding Councils of England, Scotland, Wales and Northern Ireland.

The aim of HEPS is to help higher education institutions deliver their own strategic objectives through positive engagement with the sustainable development agenda and to share that expertise across the sector.

Participating universities and colleges

- University of Aberdeen
- Heriot-Watt University
- University of Birmingham
- University of Brighton
- University of Cambridge
- City University
- Liverpool John Moores University
- Loughborough University
- Queen's University Belfast
- University of St Andrews
- University of Stirling
- Middlesex University
- University of Newcastle
- University of Salford
- Sheffield Hallam University
- College of St Mark and St John
- The Surrey Institute of Art & Design
- Cardiff University

The HEPS approaches universities and colleges in their three roles in society, as

- institutions that form and inform leaders and decision-makers of today and tomorrow through teaching and research agendas
- managers of major businesses where prudent use of resources not only saves money but safeguards reputations
- important bodies in the local communities and regional development – as employer, purchaser, service user and provider.

Commitment to active engagement in the partnership was agreed at vice-chancellor or principal level. All staff, students and the wider community of the university or college are encouraged to participate in HEPS. The work of HEPS is delivered through three types of activities:

- individual work programmes tailored to the institution's priorities
- partnership-wide capacity building activities covering areas of interest to all partners (eg purchasing, travel planning, finance, resource management and communicating for sustainability)
- sustainability reporting: developing a framework and process for tracking progress and communicating an institution's contribution towards sustainable development.

More information about HEPS may be found at www.heps.org.uk.

Section 1 Learning and skills for sustainable development

1

In this section, developments in the policy areas of sustainable development and the skills needed for a competitive UK in the 21st century are noted, as is the growing convergence between the two. Although not quantified as yet, it is likely that there will be a growing demand from employers and from prospective students for courses of all types that include sustainable literacy as an outcome.

1.1 Sustainability literacy and learning and skills for the 21st century

Sustainable development

The term 'sustainable development' gained currency after the 1992 Earth Summit in Rio de Janeiro. In effect, over 170 governments agreed that human development aspirations and the capacity of the environment to support them were on a collision course. Sustainable development became the overarching policy framework within which governments would seek to address the challenges of unsustainable development patterns. At the time, the most widely used definition described sustainable development as *"development that meets the needs of the present without compromising the ability of future generations to meet their own needs"*.¹

As governments and organisations turned to designing and trying to implement relevant policies, they discovered that this definition, however apt, needed expanding if it was to provide a useful operational framework.

The UK government, for example, defines sustainable development as meeting four objectives at the same time, in the UK and the world as a whole:

- 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.²

Unfortunately, even the government itself is prone to quoting only the four bullet points when it talks about sustainable development. This misses the crucial lesson about how we have ended up with unsustainable development. It is by pursuing our economic, social and environmental goals separately that has resulted in repeated trade offs between goals. Sustainable development is about progressing them together.

We are not in the habit of thinking about the economy, the sort of society we would like, or the sort of environment we would like to live in at the same time. In higher education institutions, each is taught as different subjects, in different departments.

¹ Report of the 1987 World Commission on Environment and Development, *Our Common Future* (The Brundtland Report).

² www.sustainable-development.gov.uk.

Sustainable development is not a political fad that is likely to pass. It is driven by evidence that, despite living in a world that is richer than ever before (global GNP is \$30 trillion a year), environmental damage escalates and poverty and inequality persist (over a quarter of the world's countries are poorer than they were in 1990 and the total income of the richest 1 per cent of people is more than that of the poorest 57 per cent). Similar trends are evident in individual countries as well as globally.

At the 2002 Summit on Sustainable Development in Johannesburg, world leaders reaffirmed their commitment to sustainable development and agreed that the top challenge was implementation. The role of education was agreed by the UN General Assembly to be critical to success, and a Decade of Education for Sustainable Development will start in 2005.

Though such moves are welcome, experience shows that exhortation at international level is only valuable if it translates into practical change on the ground. Practical change depends on adequate resources – both financial and in terms of human competence.

One of the most important drivers for sustainability literate graduates will be the demand from employers. The growth of interest in responsible corporate behaviour means companies increasingly have to manage and report on their environmental and social performance alongside their financial one. Anticipated changes to company law could make reporting of material impacts mandatory for large companies, with smaller ones influenced via the supply chain.

Learning and skills for the 21st century

“Our vision is that by 2010, the UK will be seen as a world leader in developing and deploying management and leadership capability for the 21st century. In all sectors and at all levels, individuals will have the understanding, knowledge and skills they need to enable them to grasp the right opportunities and innovations for the UK in a rapidly changing and interconnected world of market-places, communications, and social and environmental challenges.”

Council for Excellence in Management and Leadership, May 2002.³

Until the publication of the Department for Education and Skills (DfES) Sustainable Development Action Plan in September 2003⁴ and the Secretary of State's public recognition of the connection between improving the skills base of the UK and the needs of an economy that can guarantee a sustainable future for the UK,⁵ the government has pursued its skills and its sustainable development policy agendas separately.

Earlier in 2003, for example, a White Paper, *21st Century Skills: Realising our Potential*, set out the skills needed for employers to have successful businesses and for employees to be both employable and personally fulfilled.⁷ The political

3 Report of the Council for Excellence in Management and Leadership, *Managers and Leaders: Raising our Game*, DfES and DTI, May 2002.

4 www.dfes.gov.uk

5 See front cover quote: Evidence to the Environmental Audit Committee inquiry, “Learning the Sustainability Lesson”, March 2003. Available at www.parliament.co.uk

7 Department of Education and Skills, *21st Century Skills: Realising our Potential*, July 2003.

importance given to this paper is evident in the fact that the foreword is signed by the UK Prime Minister, the Chancellor and the Secretaries of State for Education and Skills, Trade and Industry and Work and Pensions. The White Paper refers to people's skills as a "vital national asset". It recognises that the UK has not invested enough in this particular asset and claims that urgent change is needed to meet the challenges of the next century – that is a competitive, productive economy, a fairer, more inclusive society and sustainable employment. It also identifies skills gaps at all levels, from basic literacy to leadership and management skills.

The White Paper also acknowledges the importance of helping individuals achieve their own ambitions for themselves, their families and their communities as well as raising their employability. There is an explicit emphasis on integrating economic with social objectives for learning and the role learning and skills have to play in the general enrichment of life at home and in the community. (See Box 1).

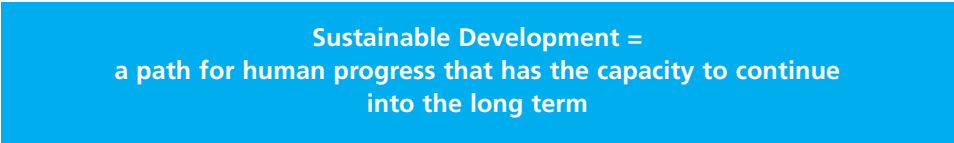
Box 1.
Skills for the 21st century

"For individuals, skills are not just about work. They also serve essential social purposes. Achieving a fair, more inclusive society depends on young people leaving school or college with the skills they need to work. Where they lack such skills, their exclusion is likely to be compounded during their lives."
(paragraph 4.4)

"Economic and social objectives are necessarily entwined. But skills serve wider purposes. For many people learning enriches their lives. They may enjoy learning for its own sake. Or it may make them better placed to give something back to their community, to help family and friends, to manage the family finances better, or help their children achieve more throughout their school careers." (paragraph 4.5)

Department for Education and Skills, *21st Century Skills: Realising our Potential*, July 2003.

However, the *21st Century Skills* paper does not make any reference to the top political challenge of the 21st century. How can the path of human development shift onto one that is sustainable and ensures that environmental objectives are entwined with social and economic ones? For example, how can the government policy on energy and sustainable consumption and production (eg 10 per cent of electricity to be generated from renewable sources by 2010)⁸ be achieved if the skills required to implement them do not even feature in the *21st Century Skills* paper?



8 See www.dti.gov.uk and www.defra.gov.uk

The DfES Sustainable Development Action Plan has given a boost to incorporating the knowledge and skills policy with that of sustainable development. But in reality, bodies such as Regional Development Agencies, the Learning and Skills Council and the Sector Skills Councils already have responsibility for the implementation of sustainable development.

The same responsibility sits, to varying degrees, with the devolved administrations in Wales, Scotland and Northern Ireland. The National Assembly for Wales has a duty to deliver sustainable development and the Higher Education Funding Council of Wales has sustainable development as part of its strategic plan.⁹ In Scotland *“sustainability is at the heart of policy”*¹⁰ and the Scottish Executive report annually on a series of sustainable development indicators. The significance of the Scottish higher education sector’s contribution to sustainable development was re-stated in the 2003 letter of guidance from the Scottish Executive to the funding councils and the Executive has also recently launched a Green Jobs Strategy.¹¹

It is becoming increasingly important to integrate sustainable development into policy and practice in both business, through devolution and regeneration and local and national government. Therefore, universities and colleges need to produce appropriately knowledgeable and skilled graduates.

In *Meeting the Needs...Priorities, Actions and Targets for sustainable development*, published in April 2002¹², the Scottish Executive set out the national vision for sustainable development. The Lifelong Learning Strategy for Scotland defines the implications of this vision for learning.

“Wider participation in lifelong learning is expected to enable people to become more aware and knowledgeable about environmental issues and the ways in which they might lead to a more sustainable lifestyle ... increased levels of knowledge and skills are the means of developing innovative solutions to the problems of sustainable development.”

Scottish Executive, *Life through Learning through Life*, February 2003.

“Sustainability literacy is a basic skill that everyone, especially engineers, should have.”

Lord Sainsbury, February 2003.¹³

9 Higher Education Funding Council for Wales Corporate Plan 2003/4-2005/6.

10 The Deputy Minister of Enterprise and Lifelong Learning for Scotland, Lewis McDonald, during his speech at Forum for the Future’s event, Sense and Sustainability, Edinburgh, 3 December 2003.

11 See www.scotland.gov.uk

12 A Scottish Executive Environment Group paper, available at www.scotland.gov.uk

13 Lord Sainsbury, during his address to a conference on the publication of the Forum for the Future report, *The Engineer of the 21st Century: Change Challenges*. February 2003.



What is sustainability literacy?

Expressed at the highest level, a sustainability literate person would be expected to:

- understand the need for change to a sustainable way of doing things, individually and collectively
- have sufficient knowledge and skills to decide and act in a way that favours sustainable development
- be able to recognise and reward other people's decisions and actions that favour sustainable development.

Understand the need for change to a sustainable way of doing things, individually and collectively.

Most people do have some rudimentary understanding of what sustainable development means. However, a sustainability literate person will have sufficient knowledge and understanding to talk to others in a positive and engaging way about matters relating to sustainable development. They will be able to make a coherent argument for why change in behaviour is needed and how it might happen in practice, drawing examples from their own sphere of influence and operation and linking that to their own values and to the wider context in which they live. They will be able to make links between the social, environmental and economic aspects of sustainability and make connections between their neighbourhood, their workplace and what is happening globally.

Have sufficient knowledge and skills to decide and act in a way that favours sustainable development.

A sustainability literate person will be equipped with a number of intellectual and practical tools that enable them to take decisions and act in a way that is likely to contribute positively to sustainable development. They will be able to make decisions on specific matters, such as advising on financial investment, buying food or writing new policy for prisons, by applying the 'at the same time' rule - that is, taking environmental, social and economic considerations into account simultaneously, not separately. (See section 2.2.)

Be able to recognise and reward decisions and actions that favour sustainable development.

A key principle of reinforcing good practice or behaviour is to recognise when it is taking place and to acknowledge if not reward it. This principle applies from childcare to major publicity campaigns. A sustainability literate person will know the importance of encouraging and reinforcing behaviour that favours sustainable development.

Some people argue that a generic minimum of knowledge, skills or competencies is required to be sustainability literate, just as there is a basic level of reading and mathematical skills needed to get through life. Others argue that for sustainability literacy, as for word and number literacy, there is no real definable minimum, but the search for it can be illuminating nevertheless. There is probably truth in both views.

1.2

A new approach to understanding sustainable development

One of the barriers to integrating sustainable development into education provision is that many teachers and lecturers feel alone and unsure about the meaning of the words 'sustainable development'. Some typical responses are illustrated below.

- it is vague and meaningless, my job is difficult enough without any more confusion
- it is the environment isn't it? – and we are addressing that
- it is a political thing, an ideology, and therefore not a legitimate thing to put into my course
- it is hugely complex, a vast body of knowledge that goes across many subjects and disciplines, therefore too much to put on my course, or expect my staff (or me) to know about.

A combination of uncertainty about what to do, and a feeling of guilt about what is not being done, means that many people seem afraid to expose what they feel is their lack of understanding of sustainable development. Therefore, it is often easier to pretend that it does not need to be addressed.

Research carried out by Quadrangle, a communications consultancy, for the now defunct UK Round Table on Sustainable Development, showed that there is little understanding of the current language used to communicate sustainable development with the result that educators couldn't grasp what it encompassed.¹⁴ The research also confirms the findings from the Sustain It initiative (see Box 2) that, generally speaking, people arrive at a personal understanding about the meaning of sustainable development in many different ways, depending on their social and cultural experiences.

Forum for the Future's experience working with different organisations confirms that, despite the diverse and polarised interpretations of what sustainable development means, most people want prosperity, safe, supportive and just communities in which to live and a life supporting environment to underpin it all. They want these at the same time. Which is what sustainable development is – progressing and achieving our economic, social and environmental goals together, as a mutually reinforcing system. The challenge is not to run away from the words 'sustainable development' but to give them resonance and a practical meaning for all people.

The approach suggested in this guide starts with the world of the learner. What will they need to know and be able to do to make and maintain personal and professional relationships in a way that contributes to sustainable development in their sphere of influence? No one can be expected to do everything, but everyone has something to contribute.

As the aforementioned Quadrangle research concludes,

“the best way to educate people about sustainable development is to help them discover what the term encompasses, what it means, and how it should affect the ways they live their lives ... By helping people to understand and engage with the concept... they will discover sustainable development for themselves and begin to apply it within their world, thus establishing a basis on which to describe it in their own words.”¹⁵

¹⁴ UK Round Table on Sustainable Development report, *Developing a Language for Sustainable Development: catalysing the evolution of language*, Quadrangle Consulting Ltd, November 1999.

¹⁵ UK Round Table on Sustainable Development report prepared by Quadrangle Consulting Ltd.

Box 2. **Sustain It**

In the summer of 2001, Forum for the Future conducted a series of sustainability learner needs analysis workshops with employees from the British Airports Authority, Surrey County Council and HM Customs and Excise. The workshop found that participants, drawn mainly from the middle of the organisations:

- had very different (but largely valid) starting points and viewpoints on sustainability
- came with a wide variety of levels of prior knowledge and understanding and were not puzzled by it
- were able to structure opinions, comments and experiences if provided with an appropriate framework
- were most interested in what they needed to know to implement sustainability
- grasped the distinction between information about it (awareness, theory, facts) and operational learning about how to work towards it in their jobs
- had a clear preference for learning in groups and workshops and learning through practical examples and case studies
- valued being taken out of the workplace and working with other organisations
- recognised that e-learning could be flexible and convenient, maintained some scepticism about it.

Catherine Atthill's report on Sustain It workshops prepared for Forum for the Future, August 2001.

Sustainable development: the Five Capital Model of the Economy

To help understand sustainable development Forum for the Future has developed a framework based on the sorts of resources that are available to anyone, whether they are running a country, a company, a university or a household. Using the language of economists, we can think of these types of resources as capitals. Just as an economist would expect a flow of benefits if the stock of his or her financial capital was in good shape, we would expect a flow of benefits from other key sets of resources, or capitals, such as the environment, people, social organisations and existing infrastructure. This framework is known as the Five Capital Model of the Economy and in Box 3 we give a few examples of the sort of benefits we would expect to enjoy if the stocks of each of these resources, or capitals, was maintained or enhanced. A sustainable society can be thought of as living off the income generated by capitals (flows) rather than degrading the capitals themselves (stocks).¹⁶

¹⁶ An idea articulated well by E.F. Schumacher in *Small is Beautiful: A study of Economics as if people mattered*. Harper Collins, 2002.

Box 3 Five Capital Model of the Economy

Type of capital/resource	Examples of stocks of capital/resource	Examples of flows of benefits to be expected from a healthy stock of relevant resources
Natural	Land, sea, air, vegetation, ecological systems	Food, water, energy, waste disposal, climate
Human	Knowledge, skills, health, motivation, spiritual ease	Happiness, creativity, innovation, work, energy, participation
Social	Families, communities, organisations, governance systems, schools	Security, shared goods (eg, culture, education) inclusion, justice
Manufactured	Infrastructure, roads, buildings, tools, fixed assets	Living/working space, access, distribution, recycles
Financial	Money, stocks, bonds, banknotes	Means of valuing, owning or exchanging other four capitals

We know that the economy, or more accurately, society, has chosen not to invest in natural, human or social capital or indeed in manufactured capital as assiduously as it has in financial capital. We know what happens when we underinvest in the railways: fewer clean, prompt, safe trains. Similarly, neglecting investment in education, communities or the quality of the environment leads to interruptions in the flow of benefits in a skilled workforce, safe neighbourhoods and a stable climate.

The World Bank, the UK Department for International Development, Interface (the world's largest manufacturer of carpet tiles) and Wessex Water, among others, use this model to help them think through their strategies for world development, poverty relief and business excellence respectively.

For this guide, we adapt this framework to help determine what competencies a student should acquire in order to contribute positively to maintaining or enhancing one or more of the stocks of capital in their likely area of competence once they have graduated.

For an example of the Five Capital Model being used to explore the potential contribution of a higher education institution as a business in its own right, as a place of learning and research and as a community player see Appendix B.

Forum for the Future Masters in Leadership for Sustainable Development

A bridge between university and the workplace, for those aspiring to leadership in building a sustainable way of life.

Purpose of course

The aim of the course is to offer a fast-track experiential learning opportunity to young graduates of any discipline who demonstrate a passion for sustainability and a potential for leadership.

The programme started in 1996 and celebrated its 80th graduate in 2003. It is run from the London offices of Forum for the Future and a degree of Master of Professional Studies (MProf) is awarded by Middlesex University. This is a work-based qualification (the equivalent of the more traditional MPhil) pioneered by Middlesex University's National Centre for Work Based Learning Partnerships.¹⁷



1. Leadership for sustainable development

Each year Forum for the Future's Leadership for Sustainable Development Masters recruits twelve high flying first degree holders (of any discipline) who can demonstrate both a passion for sustainability and a potential for leadership. Our graduates are expected to enter work in a wide range of sectors and to demonstrate leadership in a myriad of contexts. A few examples of graduates' posts include:

- **Campaigning:** posts in wildlife, development and waste charities; policy advisor for a fair trade organisation
- **Local/Regional Government:** project manager for promoting locally grown food; community development officer, Community New Deal
- **Politics:** advisor to a Secretary of State; assistant to a MEP; researcher for HM Treasury
- **Business:** roles in major telecommunications, water, engineering, manufacturing, oil and consultancy companies. Several graduates are self-employed or have started their own business.
- **Finance and Regulation:** trainee commodities trader; financial analyst for socially responsible investment; policy development officer Environment Agency
- **Media:** director for sustainability communications specialists; executive assistant for senior media figure.

To enter these positions graduates have to be able to make and sustain relationships with people in various roles and in all sectors.



2. Ethics and values

Students share the values adopted by Forum for the Future while they are with us (see Values Audit Table in Appendix A) and one of the main themes of the sustainability knowledge strand of the course is Ethics and Values (see 3a. below).

¹⁷ www.mdx.ac.uk



3. Sustainability competencies

In order to be both competent and confident to offer leadership for sustainable development in any situation, graduates should possess:

a) **Sufficient knowledge about sustainable development**

Students come with varying backgrounds of knowledge and experience, so an audit at the beginning of the course establishes the resources already available within the group. Using a sustainability syllabus as a menu, a programme of seminars, lectures and workshops is established around the themes of Science; People & Community; Ecological Economics; and Ethics and Values. The framework for the sustainability syllabus is illustrated in Box 4.

Box 4 Leadership for Sustainable Development Programme sustainability syllabus

	A. Science	B. People & Community	C. Ecological Economics	D. Ethics & Values
1. Foundations		Underpinning basic knowledge for each theme		
2. Relevance		How the elements of the foundations are relevant to sustainable development		
3. Important Issues		An exploration of key current concerns from a sustainable development perspective which complements and illustrates 1, 2 and 4		
4. Applications for Change		Examples of relevant tools and processes		

The objective is for graduates to have sufficient knowledge about sustainable development to be able to act and decide in a way that favours rather than undermines it, as well as an awareness of what they don't know and therefore may need to seek expert advice on in the future.

b) **Leadership skills**

Students learn about their own style and aptitude for leadership through two sessions with the Leadership Trust – at the start and the end of the programme. Seminars throughout the year reflect on learning about the leadership style of others (as encountered through placements, for example) as well as key tools and competencies of leadership such as management (of time and people), communications, strategic planning, inspiration, modesty, continual learning and reflection.

c) **An understanding of how society works**

Often missing from leadership development courses is knowledge and understanding about the context in which any leadership must be exercised. This context may change several times in any working lifetime. So a key

element of the course is the six one month learning placements. Each student goes to a single organisation in each sector (a total of 72 placements) on a learning mission for the group. The placement is preceded by a preparatory briefing and followed by intensive de-briefings attended by some placement supervisors. The placements are taken in the following types of organisations.

- Environment or development campaigning organisation
- Local or regional government
- Member of Parliament, Member of European Parliament or government department
- Business
- Regulation or financial institution
- Media organisation



4. Learning outcomes and assessment

To be competent to offer leadership for sustainable development, graduates of the course are expected to:

- apply a holistic, up-to-date understanding of the concept of sustainable development in a wide range of contexts
- identify the opportunities and constraints for implementing sustainability solutions in different sectors, and critically evaluate what constitutes best practice
- use the tools and concepts for holistic thinking in their interpretation of their work and the workings of society

A cascade of learning outcomes stem from these high level ones, into the knowledge themes, the placements and the skills and personal development programmes.

Assessment is continual, includes self-appraisal, and students are expected to accrue competence as the year progresses. Included for assessment is:

- personal reflections at the start and end of the year
- management of placements
- placement reports (including evidence of learning)
- reports on sector learning (in pairs)
- research, production and presentation of a project proposal (group work)
- production of a final portfolio
- management of student's own learning through a learning contract.



5. Delivery methods

This is a fast track course with features that resemble a real job. High value is placed on reflective and group learning, including techniques to ensure learning from experience is captured and shared. This is not only good learning process, but also essential for sustainable development, which is really a non-discipline (see section 2.4 page 20). Conceptual and practical tools that are transferable and adaptable are used, and students are encouraged to take their own initiative.

Seminars and lectures are given by leading thinkers and practitioners, including Forum staff.



6. Promoting the programme

The course is promoted through careers services at universities and directly to some faculties, including engineering. A special effort is made to ensure a broad spread of students from different backgrounds and geographical regions. The growing alumni network assists in promoting the course, including giving talks at career fairs.

Graduates are able to go on to complete a specially designed work-based DProf (Doctorate in Professional Studies in Leadership for Sustainable Development), which several graduates have done.



7. Reviewing and renewing the programme

In addition to the regular Board of Studies meetings with Middlesex University the course is reviewed annually by Forum for the Future. A major review of the learning outcomes and sustainability syllabus is being done in the context of developing an international version of the course, supported by the Vodafone Foundation. This involves graduates and employers.

In 2004, Forum for the Future, in partnership with the Leadership Trust, will undertake research into all graduates of the Leadership for Sustainable Development Masters. The objective of this research is to examine the contribution the course has made to emerging sustainability literate leaders and their capacity to move more quickly into influential roles.

For further details and a copy of the course prospectus please visit www.forumforthefuture.org.uk.

Section 2 Good practice for learning and skills for sustainable development

The ambitions for, and the theory around, education as a promoter for sustainable development have been discussed and developed over several decades.¹⁸ However, the focus has been mainly on education relating to appreciating, protecting or managing the environment. The result in higher education has been the emergence of largely specialist courses in universities and colleges, sometimes in partnership with relevant non-governmental organisations.

The Toyne Report on Environmental Responsibility written in 1993¹⁹, its review three years later²⁰ and Forum for the Future's HE21 initiative completed in 1999²¹, revealed how relatively little had been done in the UK higher education institutions to embed sustainable development into existing provision. There were beacons of good practice around the country but provision that integrated environmental education or sustainability into, say, accountancy, was patchy, of variable quality, poorly networked and liable to disappear if key people moved on.

Moreover, without detailed research, it is difficult to differentiate between purely environmental courses and those genuinely addressing sustainable development. In some universities and colleges, existing courses have been repackaged and the word 'environment' has been substituted by the words 'sustainable development'. In others, the sustainability element is positioned as an optional module, regarding this as a first step for introducing the idea of sustainability. If the challenge of sustainable development is to progress our economic, environmental and social goals at the same time, then any course labelled as either being about or contributing to sustainable development should bring those three perspectives to bear on whatever subject is being taught.

There is evidence, however, of positive change. There are certainly more courses claiming to integrate sustainable development and a growing number of institutions genuinely trying to integrate economic, environmental and social aspects into non-environmental courses. According to the subject categorisation carried out by the UK Universities and Colleges Admissions Services (UCAS), 108 courses are badged with the word sustainability or sustainable development for 2004.

Forum for the Future believes that the most effective approach is to integrate sustainability literacy into the content and delivery of all courses in all disciplines. This needs to be done in the context of an institution with a clear strategic approach to sustainable development in the way it manages its resources and engages with its local community. Few students will take their own sustainability literacy seriously if their campus does the opposite. Drawing on the work of the HEPS partners Appendix B shows the sorts of things a university can do to contribute to sustainable development.

¹⁸ See, for example, Sterling, S. *Sustainable Education*. Totnes: Green Books, 2001. This has a useful set of references and list of organisations.

¹⁹ Report written by Professor Toyne in 1993 after chairing a committee established by the UK Government Department of Education to investigate the potential for greening higher education.

²⁰ The School Curriculum and Assessment Authority, *Teaching Environmental Matters through the National Curriculum*. 1996.

²¹ In 1997, Forum for the Future was awarded a grant by the Department of Environment, Transport and the Regions to run a two year higher education project, HE21, to identify and promote examples of good practice for sustainability. See www.forumforthefuture.org.uk.

There is a serious body of academic research and literature about education and sustainable development. We don't pretend to cover all existing literature, never mind evaluate it, but throughout this guide we acknowledge just a few of the most important sources.

We have distilled five principles from the research and from our own experience, in order to stimulate debate, innovative course design and good teaching practice around ways of integrating sustainable development into the curriculum:

- The 'at the same time' rule should be applied
- A learner-centred approach works best
- Ethics and values matter
- Sustainability literacy should be integrated into the content and delivery of all courses
- Good learning practice is essential.

2.1 The 'at the same time' rule



There is no single home for sustainability. It doesn't belong to any specific academic discipline or school subject line. Nor is it the domain of any sector – environmentalists, educators, business or government. It is everybody's business.

Similarly, it is not helpful to think of sustainable development as cross or trans or multi-disciplinary. This immediately prompts the question: which disciplines are being crossed, which are included or excluded? It is more helpful therefore to think of sustainable development as a *non-discipline*.

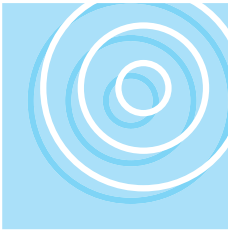
If the objective is to make thinking and acting sustainably a normal part of everyday life at home and at work, then *everyone* needs to be sustainability literate and relevant provision needs to be integrated into the content and delivery of *all* courses in *all* disciplines. This implies developing the capacity of all learners to apply what we have called the 'at the same time' rule. Whatever specialist discipline is being offered by a course, the learner should learn how to analyse issues and choices from an environmental, social and economic perspective *at the same time*, rather than separately. Even though decisions might be about specific matters, such as the purchase of a piece of equipment, a sustainability literate person would be able to evaluate the available options, from the perspective of its positive or negative life-long effect on a financial budget, on people and on the environment. Most of the time this will require a fresh approach to existing course content, sometimes it will require the addition of new ideas and materials. The purpose of this approach is to equip students with intellectual and practical decision-making tools that will stand them in good stead when making decisions throughout life.

In the world of work (as with learning) the tendency is to break down complex decisions and arguments into discrete elements or bite sized pieces. However, the success of sustainable development will depend on the capacity to re-integrate all elements of a decision. Convincing others of the case for a more sustainability favourable solution will require robust and practical ways of applying the at the same time rule to a wide range of single issues.



pages 23–27 for examples from the University of Aberdeen, University of Bath, Heriot Watt University, University of Salford and University of Stirling.

2.2 A learner-centred approach



“Learning [is] ... a development of one’s own understanding of the world and of oneself as a person.”

R. Saljo, 1993.²²

The supply side of learning (what teachers can and want to teach) has traditionally dominated the demand side (what learners and their future employers need and want to learn about), although this is changing, stimulated in part by the UK government’s shake up of education policy. This tendency is partly due to the fact that learners and future employers are not particularly effective in articulating their demands. Consequently, as a report published by Universities UK and the Career Service Unit pointed out, the dialogue between the demanders and the suppliers of knowledge and skills *“was if not one of the deaf, then certainly one of the hard of hearing”*.²³ The lack of foresight in relation to future skills needs is also highlighted by the Lambert Review.²⁴ As one industry respondent said: *“An effective mechanism for industry and academia to identify future skill requirements remains to be discovered.”*

Involving the learner, the graduate and the employer in the course design ought to be good practice for all courses, however for integrating sustainable development into provision, it is essential. The starting point for developing the relevant competencies is where the learner is and where they are likely to be after graduation. In particular, it is helpful to consider the learner in the context of the relationships that he or she has to maintain to lead a full private and professional life. These relationships may be with other people (eg family, colleagues), organisations (eg sports clubs, professional bodies) or with the physical environment (eg the office, the sea). What does the learner need to be able to do and to know, to maintain these relationships in a way that contributes to sustainable development? Using the language of relationships in a learner-centred approach brings, we feel, the process of designing a learning programme very close to the definition of learning given above.



pages 23-27 for examples from the University of Bath, Cambridge University and City University.

2.3 Ethics and values matter



Issues of ethics and values are not limited to the occasional high profile incident such as discovering the link between child sweat shop labour and the production of expensive sports goods. On the contrary, ethics and values are embedded in the ordinary routine of everyday life. For example, ask yourself what your goals are (in general or for a specific project) and then think about what would be considered unacceptable as a way of achieving these goals. The answers reveal your own ethical principles and values, or those underlying a project. Ethics and values are not necessarily always made explicit. On the contrary, they are often implicit and difficult to grasp.

Kate Rawles, the outdoor philosopher, argues that we can have as reasoned a debate about ethics and values as we can for science.²⁵ She refutes the idea that ethics and values are soft and subjective. What is right or wrong is not, for

²² “Learning Discourse: Qualitative Research in Education.” *International Journal of Education Research*, 19,3 (1993): 199-203.

²³ Universities UK, *Enhancing employability, recognising diversity: making links between higher education and the world of work*. London and Manchester: UUK and CSU, July 2002.

²⁴ Lambert Review of Business-University Collaboration: Summary of Consultation Responses and Emerging Issues. London: HM Treasury, July 2003.

²⁵ Forum for the Future, *The Engineer of the 21st Century: Change Challenges*. February 2003.

example, like a preference for butter or margarine. Reasons underpin ethics and values, and reasons can be analysed. Therefore, ethics and values, unlike tastes and preferences, are accountable to argument and reason, experience and strongly held intuitions and beliefs.

In all walks of life – business, research and government – the demand for the ethics and values governing policies and practice to be made explicit is increasing. If sustainability is to be achieved, the ethics and values that support it will be just as important as scientific and technological advance. Therefore, any course that integrates sustainability competencies successfully should make explicit the ethics and values that shape its contents and govern the way educators and learners work together.



pages 23-27 for examples from the University of Brighton, Leeds Metropolitan University, University of St Andrews and pages 13-16 for Forum for the Future Masters Programme.

2.4

Integration works best

Sustainability literacy should be integrated into the content and delivery of all curricula – from anthropology to zoology in terms of:

- Professional *specialist* elements (eg accountancy, business, plumbing)
- Professional but *transferable* elements (eg book-keeping, management)
- *Personal* elements (eg interpersonal skills, critical evaluation, reflective learning).

There is a school of thought that promotes the idea of sustainability ‘professionals’ - specialists in sustainable development. As the boundaries of sustainable development knowledge and skills are impossible to define, this approach further implies sub-disciplines within the discipline of sustainable development. This goes against the idea of sustainable development as a non-discipline, which requires simultaneous consideration of economic, social and environmental issues. The implementation of sustainable development requires bringing together aspects of choice and decision-making that are currently kept apart. Therefore, setting up a separate profession runs the risk of sustainable development being delegated to a separate department, rather than integrated into the culture and practice of an organisation.

Some colleges and universities across the UK do offer a sustainable development module as a first step to building capacity among teaching staff, testing the student market, or influencing the institution’s culture. Different attempts at modules have had different results. (See pages 23-27)

The approach promoted in this guide is the integration of *sufficient* sustainability knowledge and skills into all courses, so that over a period of time, all learners become sustainability literate and competent to decide and act in a way that favours sustainable development.



pages 23-27 for examples from Liverpool John Moores University, University of Newcastle, Sheffield Hallam University, Surrey Institute of Art and Design and the Royal Academy of Engineering Visiting Professor Scheme.

2.5 Good learning practice matters

“Seeing informal and formal learning as fundamentally separate results in stereotyping and a tendency for the advocates of one to see only the weaknesses of the other. It is more sensible to see attributes of informality and formality present in all learning situations.”²⁶

Whatever type of course is being designed, or learning methods planned, learners developing sustainability literacy will need to master a number of inter-related learning techniques, such as:

- how to find information, carry out research and make judgements about the quality of information (eg Does it come from a reliable source? How to manage with gaps or uncertainty in knowledge?)
- how to solve problems creatively and abstract learning from doing so - in particular any principles that may be transferred to other situations, including those where considerable uncertainty reigns
- how to abstract learning from experience in general. If most of our learning is informal, then techniques are needed to make the most of any experience (good or bad) including carrying forward the learning in a positive way
- how to learn through reflection on experiences. Making connections to derive additional learning and how to translate that into changed action, sometimes known as transformative learning.

Like all good teaching, the approaches and methods used should be tailored to the audience – not the other way round. For example, the context in which the learner lives, works and relates to other people and the environment may be used to make complex points as well as engender understanding about ‘right’ relationships. Fawcett and Bell²⁷ characterise these as care, respect and conviviality among humans, other organisms, communities and places.

Educationalists are all agreed that practical experience confirms taught learning. Weston champions the case for starting with practice and stitching it back to theory.²⁸ Others advocate experiential learning opportunities within courses, and bringing practitioners into the classroom. This is increasingly seen as good teaching practice, but is especially important for operationalising something as pervasive as sustainable development.



pages 23-27 examples from the University of Bath, University of Birmingham, University of Cambridge, Queen’s University, Belfast, University of Surrey, Forum for the Future Masters Programme.

Finally, the potential of e-learning or even mobile learning to future innovation in education is high on the UK government’s agenda. Despite the fact that over a quarter of all formal learning is expected to happen electronically within the next five years, research has still to come up with a blueprint for any sort of effective teaching even before the advent of the electronic age!²⁹

The future of good learning practice, therefore, is very much up for grabs and will certainly challenge the current traditional model of students travelling to schools,

²⁶ Learning and Skills Research Centre (LSRC) report, *Informality and Formality in learning*. LSRC, 2003.

²⁷ Fawcett, L. and Bell, A.C. “Guiding our environmental praxis: Teaching and learning for social and environmental justice” in *Teaching Sustainability at Universities: Towards Curriculum Greening*. Leal Filho, W. (Ed.) New York: Peter Lang, 2002.

²⁸ Weston, A. “Deschooling environmental education” in *Canadian Journal of Environmental Education*, Vol 1, (1996), 35 – 46.

²⁹ Pollard, E. and Hillage, J. *Exploring e-learning*. The Institute of Employment Studies Report 376, 2001.

universities and colleges in order to learn. The Open University, for example, has pioneered taking learning to the learner, and in doing so has confirmed the need for high quality teachers – as real and virtual tutors – and for bringing groups together in learning circles. Mediating the interface between formal and informal learning has never been more important, or exciting.

Professor William Scott and Dr Stephen Gough of the Centre for Research Education and the Environment at the University of Bath, have explored the relationship between learning and sustainable development in two companion volumes.³⁰ They emphasise that learning is a living and mutual process. They argue that implementing sustainable development successfully means, by definition, sharing and developing new practice. They also argue that lifelong learning should mean what it says – learning throughout life, and through living it. Learning is at once part of sustainable development and the route to achieving it.

“Any strategy for social change needs to take account of learning which happens incidentally, and independently, of teaching programmes and sometimes despite them.”³¹

30 Scott, W. and Gough, S. *Sustainable Development and Learning. Framing the Issue*. London: Routledge Falmer, 2003.
Scott, W. and Gough, S. *Key Issues in Sustainable Development and Learning, A Critical Review*. London: Routledge Falmer, 2003.

31 Scott, W. A. H. and Gough, S. R. “Education and Sustainable Development in UK Universities: a critical exploration post-Rio”; in Blaze Corcoran, P and Wals, A. E. J. (Eds.) *Higher Education and the Challenge of Sustainability: Problematics, Practice and Promise*. Dordrecht: Kluwer, 2004.

Different approaches to integrating sustainable development into the curriculum

This section gives illustrations of the different approaches that the HEPS partners and several other UK higher education institutions have taken to integrate sustainable development into the curriculum. These include optional stand alone modules for first year students, modules designed for specific courses, dedicated sustainable development undergraduate and postgraduate degree programmes and finally discipline specific degree programmes which have sustainability literacy integrated into their content.

Course details	Interesting features
<p>MSc/PGDip in Sustainable Rural Development</p> <p>University of Aberdeen www.aberdeen.ac.uk</p>	<p>This programme incorporates the economic, social and environmental dimensions of rural development. It is based in the Department of Geography and Environment and has components delivered by the departments of Philosophy, Agriculture and Forestry, Plant and Soil Science and Zoology. A European language module is available and there is emphasis on transferable intellectual, practical and personal skills. The recent course review was informed by a survey of former graduates, and research into rural employment markets. This course is marketed using an e-logo in the prospectus. (See page 47).</p>
<p>BA/BSc in Sustainable Development</p> <p>University of Wales, Bangor www.bangor.ac.uk</p>	<p>This programme is delivered by various departments including Business and Regional Development, Social Sciences, Ocean Sciences, Agriculture and Forest Sciences and Biological Sciences. After a first year of compulsory modules, students take a core of modules to retain breadth while specialising in either economics and society (BA) or the science of the environment (BSc). A third of the final year is spent on an individual research project.</p>
<p>MSc in Responsibility and Business Practice</p> <p>University of Bath www.bath.ac.uk</p>	<p>This two-year part time programme integrates successful business practice with a concern for social, environmental and ethical issues. The programme is delivered by the Centre for Action Research in Professional Practice in the School of Management in partnership with the New Academy of Business. Students learn about innovative management techniques and approaches and test the relevance of these ideas and practices in their own workplaces. Participants are encouraged to act and reflect on their learning while in the workplace. Many aspects of the course are open to negotiation between staff and students, individually and collectively. Peer support and mutual learning are important features of the course and staff and participants work together to review the programme on an ongoing basis.</p>
<p>BSc in Interdisciplinary Technologies, BA in Arts and Humanities and Technology</p> <p>University of Birmingham www.bham.ac.uk</p>	<p>A significant element of the teaching of these programmes is case-study driven, involving external clients addressing real sustainability challenges. Examples have included a team of 18 students acting as a consultancy for the university environmental co-ordinator, (examining sustainable practices on campus) and looking at how to recycle old computers for a local charity. A common core of general technological principles, techniques and materials is complemented by a wide range of special topics covering disaster management, sustainable energy, developing countries and appropriate technology and sustainability. Arts and humanities students combine their degree with science and technology there is a major research or design project in the final year.</p>

<p>Undergraduate module: Citizenship</p> <p>University of Brighton www.brighton.ac.uk</p>	<p>This module for students of the School of the Environment addresses the global dimension of sustainable development, local Agenda 21 and personal responsibility. Options include energy, waste management, health, transport and environmental management. The module is assessed by an individual and a group project. Group work includes the production of a Green Map of Brighton, which is used to inform the city council's sustainability strategy. The university is now considering reviewing the curriculum more widely for its contribution to sustainable development.</p>
<p>Cambridge Programme for Industry (CPI)</p> <p>University of Cambridge www.cpi.cam.ac.uk</p>	<p>The University of Cambridge Programme for Industry (CPI) is the University's department for professional education. CPI draws widely from the entire range of academic disciplines within the University, as well as from relevant expertise in industry and civil society (including Forum for the Future). Its current portfolio of sustainable development programmes includes executive education programmes on sustainable business; an e-learning tutorial on the business case for sustainable development; bespoke corporate executive programmes and part-time, university accredited courses on sustainable development, intercultural management and cross-sector partnerships. Most courses involve workplace learning supported by on-line learning.</p>
<p>MSc in Sustainability, Planning and Environmental Policy</p> <p>Cardiff University www.cardiff.ac.uk</p>	<p>This programme is taught in the School of City and Regional Planning and links the theoretical debates about sustainability with the practical dimensions of environmental policy formulation and implementation. The course includes an overseas field study visit and is assessed through written, practical and project work. The course consists of ten taught modules, including Theories and Principles of Sustainable Development, Sustainable Towns and Cities, Environmental Assessment and Corporate Environmental Management.</p>
<p>MSc in Energy and Environmental Technology and Economics</p> <p>City University www.city.ac.uk</p>	<p>This programme has been designed to develop skills in cost-effective management of energy resources and in managing commercial and industrial development within tight environmental constraints. As students come from financial, management or technological backgrounds, special introductory modules have been tailored to provide a common starting point for all. The course is part time and modular and includes two major projects. Modules include risk management, industry and the built environment and corporate energy management.</p>
<p>MSc/Dip in Sustainable Process Management</p> <p>Heriot Watt University www.hw.ac.uk</p>	<p>This programme is delivered by the School of Engineering and Physical Science and aims to equip its graduates with the knowledge and management tools for sustainable process operations in business. The core modules cover sustainable process management, industrial best practice and environmental policy and legislation and the management tools include environmental management systems, impact assessment, environmental economics and renewable energy technology. The course can be taken by working professionals on a part time basis.</p>
<p>Undergraduate module: Globalisation and ethics in the workplace</p> <p>Leeds Metropolitan University www.leeds.ac.uk</p>	<p>This optional module was designed for undergraduate engineering students. Students are challenged to reflect upon how personal, corporate and professional value systems develop, and how to exercise responsible global citizenship in the workplace. Since the development of the module, a working group has been tasked by the Learning and Teaching Assessment Committee to review the various curriculum initiatives that exist across the university such as those relating to global perspectives, disability, race equality, cross cultural capabilities and values.</p>

<p>BA in Sustainable Development</p> <p>The College of St Mark and St John www.marjon.ac.uk</p>	<p>The first year of this course introduces sustainable development using local, national and international case studies and students develop a number of key skills for working in a multidisciplinary field. Students then specialise in either environmental or socio-economic and political strands. Modules in the environment strand vary from Habitat Conservation to Space, Power and Society, and modules in the socio-economic strand include Management Ethics and Social Exclusion. Field work and work placements include environmental conservation, sustainable tourism and rural and urban regeneration.</p>
<p>MSc in Urban Renewal</p> <p>Liverpool John Moores University www.livjm.ac.uk</p>	<p>This course is taught in the School of the Built Environment and aims to enhance students' skills and understanding in the field of urban renewal. The course combines both socio-economic and environmental design knowledge in the search for, and understanding of, solutions to urban renewal and regeneration challenges.</p>
<p>MSc/Dip/Cert in Environmental Studies</p> <p>Loughborough University www.lboro.ac.uk</p>	<p>This course integrates environmental science with manufacturing, engineering and science. The programme has been developed with the Faculties of Science, Engineering and Social Science and Humanities. Four research centres and four departments are involved in delivering the course. Modules are focussed around three themes: waste minimisation, energy and environmental management and water quality and pollution. All engineering students have the option of a module on engineering design for sustainable development.</p>
<p>MA in Sustainable Development</p> <p>Middlesex University www.mdx.ac.uk</p>	<p>This programme is located in the School of Health and Social Science and is designed for both UK and overseas students with an interest in development interventions in developing countries. Many of the modules are shared with the MA/MSc in Sustainable Environmental Management and these include disaster mitigation, gender power relations and sustainable tourism management. All students undertake training in research and project methods and carry out field work and some students go on work placements. Middlesex also validate the Forum for the Future Masters in Leadership for Sustainable Development. (See pages 13-16).</p>
<p>BSc in Rural Studies</p> <p>University of Newcastle www.newcastle.ac.uk</p>	<p>This course focuses on an integrated social science approach to issues of rural development, addressing the social, economic and political systems used to support rural communities. All students develop skills in business management, economics and information technology and complement their core study with a wide variety of options, including languages, anthropology, marketing, politics, accountancy, communication techniques, planning, psychology and law. The final research project can be carried out while on work placement. Other approaches at Newcastle include the sustainable engineering programme which is available at undergraduate and postgraduate level; over 50 add-on modules relating to sustainable development or the environment and Sustainable Industry courses for professionals.</p>
<p>MSc/PGDip in Rural Development and Project Management</p> <p>Queen's University, Belfast www.qub.ac.uk</p>	<p>This programme is delivered by the Gibson Institute for Land, Food and Environment. Students have six compulsory modules which address a wide range of political and practical aspects of the rural economy, including state policy, project management techniques, people and community, processes and planning. These are supplemented by external speakers and demonstrations and the students spend 12 weeks on a work experience placement which is assessed by a written report and oral presentation. This programme is also available part time for working professionals.</p>

<p>Undergraduate module: Sustainability: ensuring our common future</p> <p>University of St Andrews www.st-andrews.ac.uk</p>	<p>The departments of Geography and Geosciences, Social Sciences, History, Economics, Biology, Chemistry, Divinity and International Relations are all involved in delivering this twenty credit module which is offered to all first year students. The university's environmental manager also teaches on this module, using the energy, transport and procurement practices of the institution as a case study. In response to positive feedback and high recruitment levels (75 students took the module in its first year), the university is now considering developing an undergraduate degree related to sustainability and has set up a working group to look at the feasibility of this.</p>
<p>MSc/PGDip in Energy Technology for Sustainable Development</p> <p>Salford University www.salford.ac.uk</p>	<p>This course focuses on energy generation, utilisation and planning for sustainable development. Students have introductory units on the geographical, social and economic context of energy, before focusing on sources, conversion, transmission and storage of energy. Students learn through case studies, course work and a dissertation, which is often carried out in industry and in energy-related community projects.</p>
<p>Sustainability Statement adopted by the Academic Board</p> <p>Sheffield Hallam University www.shu.ac.uk</p>	<p>The Academic Board has adopted the following statement; <i>"Sheffield Hallam University students, as reflective and professional practitioners, as responsible and active citizens, and as members of the wider community, should be encouraged through appropriate aspects of their curriculum to develop awareness of the ecological, ethical, political and social dimensions and relationships of their studies and personal professional, practice to the wider environment."</i></p> <p>The university now expects programme planning teams to explicitly develop the curriculum in line with the above policy statement, incorporating appropriate statements and learning outcomes into documentation submitted for validation.</p>
<p>MSc in Education for Sustainability</p> <p>South Bank University www.lsbu.ac.uk</p>	<p>The part-time distance learning programme was developed in collaboration with the World Wide Fund for Nature and supported by a range of environmental and development organisations. The programme is targeted at professional practitioners working in education. The participatory nature of the subject is reflected in the style of learning. Students use interactive study guides and negotiate their own learning pathways and there is emphasis on critical and reflective practice and self-conscious action. All units make use of case studies which are designed to be applicable in any educational or country context. There are a number of study options including full time, part time and distance learning.</p>
<p>MSc/PGDip/Certificate in Sustainable Development</p> <p>University of Stirling www.stirling.ac.uk</p>	<p>This postgraduate course offered by the School of Biological and Environmental Sciences addresses the principles, policy, management and economics of sustainable development. The programme is designed for UK and international students. Many of the modules are shared with the MSc in Environmental Management. There are opportunities to focus on the international perspective, communities, processes and the business perspective. Learning outcomes cover scientific principles, the economic, social, political and legal frameworks for sustainable development and intellectual, practical and generic skills. Some lectures are given by professionals working in sustainable development and part time options are also available.</p>

<p>Engineering Doctorate (EngD) in Environmental Technology</p> <p>University of Surrey/Brunel University www.surrey.ac.uk www.brunel.ac.uk</p>	<p>Students of this postgraduate degree are sponsored by a company and come to the university 15 times over four years to attend week-long courses on environmental technology, business and communication skills and other areas. Previous projects have included Environmental Improvements in the Electronics Supply Chain, Environmental Fluid Dynamics, Sustainable Design and Manufacture. The Programme has a portfolio of over 130 EngD research projects with forty sponsoring organisations.</p>
<p>Postgraduate Certificate programme in Environmental Life Cycle Management</p> <p>University of Surrey www.surrey.ac.uk</p>	<p>This programme is targeted at professionals who spend no more than five days away from their workplace over the year long course. Learning is through practical projects and interactive discussion among participants, in-depth exploration of the industry-specific implications of life cycle management and use of state-of-the-art distance learning materials. Participants carry out a three-day intensive training course to learn about the role of life cycle management in delivering sustainability and undertake an in-depth life cycle study of a product or process relevant to their workplace.</p>
<p>BA in Product design: Sustainable futures</p> <p>Surrey Institute of Art and Design www.surrart.ac.uk</p>	<p>The aim of the undergraduate course is to create product designers who, along with conventional design criteria, have the added knowledge of how to include criteria for sustainability into the design process. The programme makes use of visiting lectures from practising product designers and environmental design consultants, and also involves field trips, placements, research opportunities and 'live' projects. The postgraduate programme in Sustainable Design blends a conceptual understanding of sustainable development with the practical design of products, communications, environments, processes or services.</p>
<p>Access to Education for Sustainability to all students</p> <p>University of Wales, Swansea www.swansea.ac.uk</p>	<p>The University of Wales Swansea has a commitment in its Environmental Policy Statement to enable all students to access Education for Sustainability. An introductory sustainable development module is available to all students. Four new degree schemes are being introduced which aim to produce sustainability literate discipline specialists; Chemistry with sustainable development, Geography with sustainable development, Development Studies with sustainable development and Engineering with sustainable development. There is also a Higher Education Certificate for Sustainability which gives Adult learners a first introduction into the field and may eventually become a pathway into the above degree schemes.</p>
<p>Royal Academy of Engineering Visiting Professors Scheme</p> <p>www.raeng.org.uk</p>	<p>The purpose of this scheme is to develop teaching materials, based on case studies, which will enhance both the understanding and the practice of teaching of sustainable development. The general approach is to embed sustainable development in the teaching and learning culture. The scheme has been running since 1998, during which time the Academy has sponsored a total of 21 universities (including nine of the HEPS partners) to develop such teaching material. All material is made widely available to all universities.</p>

We have highlighted here just a few examples of different approaches to integrating sustainable development into the curriculum. There will of course be many more, from UK institutions and internationally. Use this table to note the details of other approaches which may interest you or inspire others.



Course details	Interesting features

Section Curriculum design toolkit

3

This section sets out seven steps to curriculum design that seek to integrate sustainability provision into the content and delivery of both existing and new courses. Each step combines existing good practice with new approaches to coping with the special challenges sustainability presents. Most of the steps are standard in good practice course design. This section also provides intellectual and practical tools to help institutions think through any decision, large or small, in a sustainable development context. An example of the curriculum design toolkit applied to the Forum for the Future Leadership and Sustainable Development Masters Programme may be found on pages 13-16.

Box 6 Curriculum design toolkit

Step	Outcome
1  Mapping the learner's world	The key relationships the learner will have to maintain in the world of work and life once they have graduated are identified.
2  Making ethics and values explicit	The ethical framework and set of values that shape the course is made explicit in relation to both content and teaching approaches.
3  Determining sustainability competencies	A set of sustainability competencies relevant to the course (and the eventual world of the graduate) is identified – some in relation to the specialism of the course, some transferable.
4  Identifying learning outcomes	The level of the course, in relation to degree of competence, is set, (including compliance with any professional standards that may be relevant) and the learning outcomes are drawn up. The knowledge and skills students need to achieve the learning outcomes are identified, either in advance, or by teachers or students together and assessment procedures are set.
5  Deciding on the best delivery methodology	An appropriate delivery method is selected and tailored to the type and level of course and the style of learner(s).
6  Promoting the course	Prospective students understand the relevance of and are attracted to a course that provides knowledge, understanding and skills relating to sustainable development.
7  Reviewing and renewing the course	With graduates, employers and others, the course is reviewed and renewed regularly to ensure it remains relevant to the world in which its graduates will live and work.

The process and tools described in Box 6 were first assembled and then developed and tested with the staff and students of the University of Antofagasta in Chile. (See Box 7). In the summer of 2002, Forum for the Future were commissioned to help integrate sustainable development into new courses in the university faculties of engineering, marine resources, law, teacher training and medicine. A total of 60 students and lecturers (including deans of faculties) participated in this process.

Firstly, profiles of the personal and working relationships graduates would need to maintain were identified through interviews with professionals already working in these fields. On the basis of these profiles, heads of departments and students determined the competencies needed in order to conduct those relationships to a high professional standard and in a way that favours sustainable development. Subsequently, new courses were designed to integrate these elements.

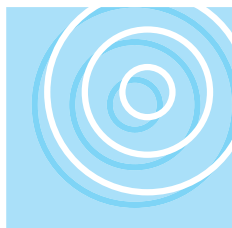
Box 7.

Key findings from the University of Antofagasta, Chile

- Both students and lecturers felt existing provision did not prepare graduates for the diversity of relationships they would need to manage in their professional lives.
- Lecturers felt more external input was needed in course design.
- Doing a 'values check' on the way a course is run highlighted key areas where assessment and feedback could be improved.
- Lecturers moved away from setting course objectives (what would be delivered) to thinking of desired learning outcomes (what the learner would be able to do as a result of the course).
- Knowledge and skills must relate to the course content, but also be relevant to the context in which they will be applied. (For example, medical students were taught that the doctor is the head of a team, but were not taught the skills of leadership).
- As well as sustainability 'literacy', analytical, interpersonal, communication, practical and management skills were identified as necessary outcomes for graduates in all disciplines.
- Motivation, self-esteem and the application of personal ethics to decision-making were seen as important to perform a job well.
- Students and lecturers felt there should be more practical focus to their courses, in particular through work placements.
- The whole experience was empowering for the students and gave the lecturers useful insight into improving their courses.

www.uantof.cl

3.1 Mapping the learner's world

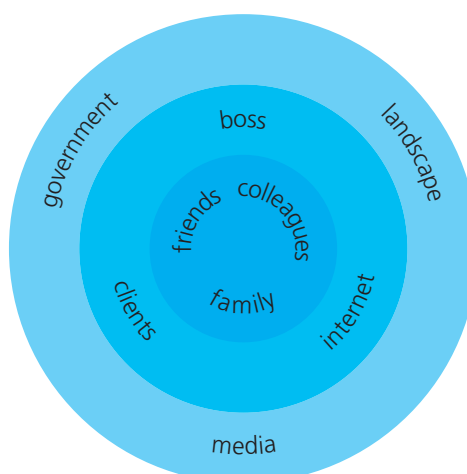


“People are conceptualised first and foremost as social beings, who derive a sense of who they are, how they should behave and what they should believe on the basis of their group membership.”

Angoustinos and Walker, 1995.³³

The Learner Relationship Profile tool has been designed by Forum for the Future to map the key relationships that the learner will have to maintain in the world in which they will be living and working once they have graduated. It consists of concentric circles, with the most important relationships for the learner at the centre, working outwards to less central (but still important) relationships. These relationships may be with individuals, organisations or the physical environment. A simplified version is given here (see Figure 1), but see Appendix A for a larger illustration of the types of relationships that might be involved.

Figure 1.
Example of a Learner Relationship Profile



New learners may have limited experience of the world in which they will be working. Therefore information to feed into the learner relationship profile should be gathered from graduates, employers, colleagues from different disciplines and others, not only in relation to the course, but also in terms of the transferable skills that will be needed. What would they add to the learner relationship profile? Where would they place more or less emphasis? How has their own learning experience equipped them for life?

For example, a marine biology student (see Figure 2) will anticipate the world of relationships he or she will have to maintain, informed by his or her current experience – family, student environmental groups and the world as seen through elements of the course. A qualified marine biologist already working in a Fisheries Department might see his or her relationships differently, informed by years of work experience (see Figure 3).

Ultimately, it is the people procuring, designing and delivering the course who will have to mediate all the contributions made to the learner relationship profile and ensure that the course is forward looking, and relevant to the outside world as well as the learner. The process for capturing the range of key relationships should be a facilitated one, using simple prompts. (See Appendix A for a blank Learner Relationship Profile you can use.)

³³ Angoustinos, M. and Walker, I. *Social Cognition, an Integrated Introduction*. London: Sage 1995.

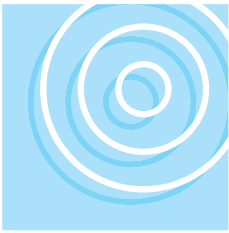


Figure 2.
Learner Relationship Profile for a marine biology student

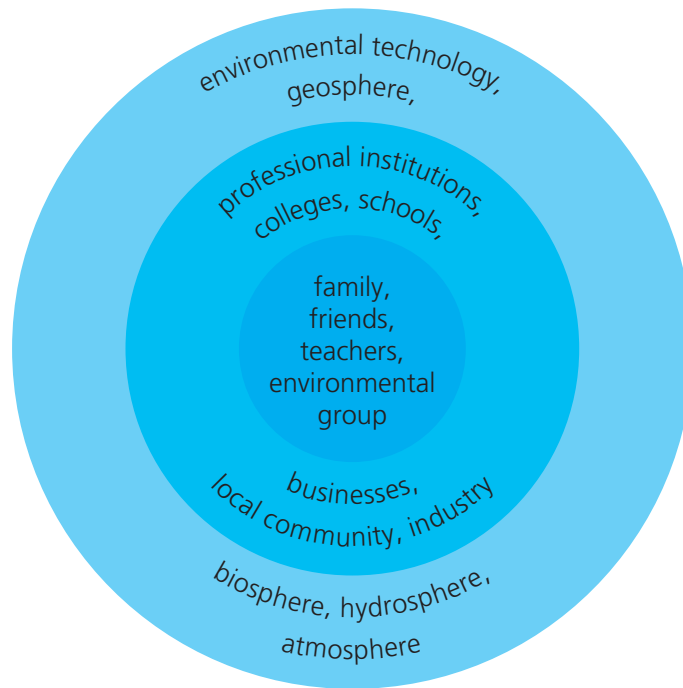


Figure 3.
Learner Relationship Profile for a qualified marine biologist



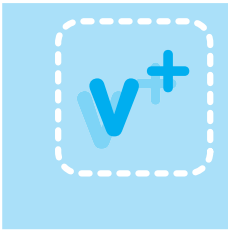


The use of the Learner Relationship Profile in different contexts has shown that family, social networks and the environment play the most important role in people's lives. So courses designed to help learners conduct these relationships, as well as those related specifically to their work, in an integrated and positive way should be attractive to students. They should help produce graduates with good technical skills, but also with good transferable skills, such as communication, team working or business awareness.

There is a large body of research about personal and cultural identity, which can help to map the social context of the learner. In the context of sustainable development, the focus needs to be widened to include not only the learner's relationship with people, but also with significant objects and the physical environment. For example, the marine biologist's relationship with the sea might involve a strategy that will protect fishing stocks while providing the fishermen with a living. Fishing trips will also be planned safely if the sea is respected and understood.

3.2

Making ethics and values explicit



"Sustainable development is as much about ethics and values as it is about science and technology. ... particular sets of ethics and values are often implicit, and difficult to see. A first task then is to identify the ethics and values we currently hold as individuals, as professions and as societies. We can then ask whether the ethics and values we have are the ones we would choose if we actually sat down and thought about it. Do they place sufficient emphasis on 'sustainability values' for example?"

Forum for the Future, 2000.³⁴

When addressing ethics and values in the context of learning for sustainable development, two perspectives need to be taken into consideration:

- the ethics and values embedded in the course itself
- the ethics and values of the institution offering the course and the way it is taught.

Although here we are advocating the inclusion of ethics and values specifically in relation to educational provision, there is also a drive to making them explicit in the world of business and government. (See section 2.3 page 19 and Box 8).

Box 8.

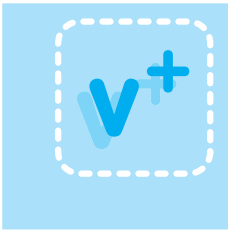
Just values

Companies and organisations are increasingly thinking about their values in relation to sustainable development. According to BT, for example, there are four principle moral foundations that underpin the advocacy of sustainable development:

- Equity today – addressing the injustice of poverty and lack of opportunities afflicting so many people in the world
- Environmental justice – closely related to equity but defined as equal access to a clean environment and equal protection from possible environmental harm, irrespective of race, income, class or any other differentiating feature of socio-economic status
- Intergenerational equity – being sure that what we do today leaves a world that is in a good state to support our children, and their children
- Stewardship – taking responsibility for the rest of life on Earth, remembering we depend on the millions of other species for the maintenance of the Earth's ecological systems.

BT, *Just Values*, 2003. www.bt.com

³⁴ Forum for the Future report, *The Engineer of the 21st Century Inquiry: Engineers for Sustainability*. London, 2000.



The ethics and values embedded in the course

When designing a new course, you may want to start to think about ethics and values either with a blank sheet of paper or with an existing statement. A discussion with a group of learners – and if possible potential employers – might be the best way to fill in the sheet, or tailor an existing set of values to the purpose of the course. Indeed, a discussion around ethics and values can be a significant learning experience for all groups involved.

Before concentrating on the course and the way it is delivered, the following questions might stimulate discussion by helping participants think about their own position :

- How do you define ethics?
- Which ethical principles do you try to live by?
- To what extent do you find that your ethics and values are supported or not supported by contemporary society?
- Have your ethical principles and values ever changed significantly throughout your life? If so what prompted that change?
- Do you think we have any ethical responsibilities to the non-human world?

Course designers may wish to make any ethical framework or values statement relating to the course explicit in their prospectus and guidelines, or they may prefer to do so later with the students. By returning to the course's ethical framework from time to time, it will be possible to see whether students and teachers wish to amend it and to explore whether personal sets of ethics and values have changed during the course.

The ethics and values of the institution offering the course and the way it is taught

There is a general belief that students entering university and employees entering the workplace need to leave their personal ethics and values at home. This is changing. More employees want to work for a 'value-driven' organisation and businesses are realising that they need to be 'value-driven' to attract and retain effective employees. As BT puts it: *"As more companies look inwards and ask themselves 'why are we here?', it is important to ensure that the objectives of sustainable development in its very widest sense, are built into the answer."*³⁶

As well as understanding the ethics and values that shape the contents of their courses, students should also be aware of the ethical framework and shared set of values that govern their place of learning. It might be worthwhile to spend time clarifying the ground rules and making explicit the values underpinning the way the course will be delivered. This is an effective way of establishing a relationship of trust between teachers and students. The set of values established does not need to be taken on board by every single person, though this is a worthwhile goal to strive for, but should be made explicit so everyone knows what they are. Again, practice should be checked against the values set during and at the end of the course, not in a big brother sense, but as part of the learning experience.

³⁶ BT, *Changing Values*, 1998 available at www.bt.com



A framework for checking whether a course is being delivered in a way that complements the agreed values of the institution and learners can be found in Appendix A. (See Values Audit Table). Forum for the Future's values are used in this example, however it is key that the values used by others are pertinent to both learners and teachers.

Box 9.

Preferred Futures

The students of the Bournemouth Business School who take the module entitled Global Responsibility and Sustainable Business Practice undertake an exercise at the beginning of their course called Preferred Futures, which is a discussion around the following questions:

- What would you like society to look like in the future?
- What do you want the course to do, to enable you to make a contribution to making that preferred future a reality?
- What are the values that we can incorporate into the way we teach this course that will enable us to achieve this goal?

www.bournemouth.ac.uk

3.3 Determining sustainability competencies



“Competence includes the knowledge, understanding and skills that underpin performance. It is attained through a mixture of education, training and professional development. ... Competence is ultimately assessed through a Professional Review, against specified standards”

Engineering Council, *United Kingdom Standards for Professional Engineering Competence*, (UK-SPEC) June 2003.

Forum for the Future defines sustainability competency as:

what a graduate should be able to do to manage the relationships in their sphere of influence in a way that simultaneously maintains or enhances the resources available to us.

Establishing relevant sustainability competencies for a course is an important step on the route to writing learning outcomes. You need to identify exactly what a successful sustainability literate graduate will be able to do as a result of your course. This is likely to have:

- Professional *specialist* elements (eg accountancy, business, plumbing)
- Professional but *transferable* elements (eg book-keeping, management)
- *Personal* elements (eg interpersonal skills, critical evaluation, reflective learning).

In vocational disciplines, such as teaching, engineering, accountancy, plumbing or hairdressing, the emphasis is shifting from describing the *contents* of a course to identifying the activities the graduate should be *able to do* in a sufficiently skilful way. Knowledge and understanding are valuable, but demonstrable capacity to apply both appropriately is equally important.

For example, the benchmark statement for geography from the Quality Assurance Agency for higher education specifies that students must *“demonstrate the reciprocal relationships between physical and human environments.”*³⁷

The Engineering Council has already identified three high-level sustainability competencies for engineers. This means that the bodies responsible for the teaching, academic quality assurance, specialist professional standards and the development of engineers will have to ensure that their provision creates sustainability competent engineers. (See Box 10).

The following process can help to determine the sustainability competencies that are relevant to a graduate of any course.

1. Starting from the Learner’s Relationship Profile (see section 3.2) and any work on ethics and values already to hand (see section 3.3), classify the key relationships into professional and personal.
2. Take into account the level of competency and any associated professional standards involved.
3. For each relationship, use the Sustainability Competencies Matrix (see page 39) to identify the competencies needed (what the graduate should be able to do) to maintain relationships to an appropriate professional standard, whilst maintaining and enhancing the resources on which we depend to progress to a sustainable way of life.

³⁷ Quality Assurance Agency for Higher Education, *Geography benchmark statement*, 2000.



4. Start with the professional specialist aspect of the relationship (eg understanding principles of eco-design), then the professional transferable competencies (eg knowing about contracts and agreements), and, finally, the personal elements (eg interpersonal skills, recognising the importance of a good life/work balance in self and others).
5. As more relationships are analysed, some competencies are repeated. Although laborious the first time this is done, the reward will be greater ease in writing the learning outcomes and defining knowledge, understanding and skills for the course. This analysis will also be a significant resource for advertising the course to students and potential employers alike.
6. It is recommended that sustainability competencies – like the learner relationship profile – are defined in partnership not only with learners, but also with working graduates of the course and their employers.
7. Rationalise and prioritise the output of this process – which will be a menu of competencies. Apply the ‘at the same time’ rule continuously, and keep sight of those competencies that are common to a number of different relationships and are therefore most likely to be transferable.

Box 10.

Competence and commitment standards for chartered engineers

Chartered engineers of any engineering discipline must be competent, by virtue of their initial training and throughout their working life, to:

- creatively use a combination of general and specialist engineering knowledge and understanding to optimise the application of existing and emerging technology
- apply appropriate theoretical and practical methods to the analysis and solution of engineering problems
- provide technical, commercial and managerial leadership
- use effective communication and interpersonal skills
- make a personal commitment to live by the appropriate code of professional conduct, recognising obligations to society, the profession and the environment.

In December 2003, high-level statements on the competencies of Chartered and Incorporated Engineers were published by the Engineering Council, the profession’s body charged with standard setting and registration. The statement includes the ability to *“undertake engineering activities in a way that contributes to sustainable development”*.

Typically this would include the ability to:

- operate and act responsibly, taking account of the need to progress environmental, social and economic outcomes simultaneously
- use imagination, creativity and innovation to provide products and services which maintain and enhance the quality of the environment and community, and meet financial obligations
- understand and encourage stakeholder involvement.

www.engc.org.uk



Sustainability Competencies Matrix

The sustainability competencies matrix may be used to help identify the sustainability competencies for any discipline, whether designing a new course, or adapting an existing one. To begin with, competencies may be expressed at a high level, then unpacked into more detail for different specialisms. (See Box 10 on page 38).

The published set of competencies may be organised in a way that is appropriate to the course and its potential learners, but using the sustainability competencies matrix behind the scenes can be helpful in maintaining coherence and consistency with positive sustainable development outcomes. It is a key tool when it comes to applying the 'at the same time' test.

What should a graduate be sufficiently good at or able to do to manage the relationships in their sphere of influence in a way that maintains or enhances the resources or capitals available to us?	
The five sets of resources (or capitals) that need to be in good shape to deliver a flow of benefits.	Competency
<p>NATURAL CAPITAL The resources and services provided by the natural world.</p>	
<p>HUMAN CAPITAL The energy, motivation and capacity for making relationships, and the intelligence and health of individuals.</p>	
<p>SOCIAL CAPITAL The social groupings that add value to individuals (eg families, communities, parliaments, universities).</p>	
<p>MANUFACTURED CAPITAL The material and infrastructure that exists already – buildings, railways etc. Can it be used in a way that requires less resources and more human creativity?</p>	
<p>FINANCIAL CAPITAL The money, stocks etc that enable us to put a value on, and buy and sell, the above resources. Are there ways that value can more accurately represent the real cost of using them?</p>	

An example of how the Sustainability Competencies Matrix has been used to determine sustainability competencies for an architect to effectively manage his or her relationship with building contractors and local authorities is shown in Appendix A.



Those involved in the process of designing courses should strive for the optimum when identifying sustainability competencies. However, it is true that, as things are today, graduates may find themselves in a context where they cannot apply their knowledge and skills. For example, securing products and services with a low impact on either the environment or people, is an art (and a science) in its infancy. A fairly brisk rate of change, however, is being driven by companies demanding such products and services. The Environment Agency of England and Wales, for example, now provides training for its suppliers to help them meet the specifications that meet high environmental and social standards.³⁹

Such is the pace of change that, by the time students entering courses today graduate, both legislation and professional standards will have changed significantly, making sustainability competencies gained today more not less relevant.

Box 11.

Sustainability competent architects

The new Architect Registration Board Criteria for Validation places increasing emphasis on an integrated understanding of the natural world. In Part 1 this includes:

“the ability to integrate knowledge of the principles of building technologies, environmental design and construction methods in relation to:

- *human wellbeing*
- *the welfare of future generations*
- *the natural world*
- *consideration of a sustainable environment*
- *use of materials*
- *process of assembly*
- *structural principles.*³⁸

A Sustainability Special Interest Group in Architectural Education, set up by the Learning and Teaching Support Network subject centre hosted in the City and Regional Planning Department at Cardiff University, have conducted research into the learning and teaching of sustainability within schools of architecture in the UK. Their final report concludes that an interdisciplinary approach be taken to learning and teaching and that steps should be taken to further facilitate sustainability learning and teaching in schools of architecture, with the support of the professional bodies.

The full report published in May 2003 is available at www.cebe.cf.ac.uk.

³⁸ Architects Registration Board, *ARB Prescription of qualifications: ARB Criteria*. April 2002.

³⁹ See www.environment-agency.gov.uk

3.4 Identifying learning outcomes



Once the competencies required for a graduate to be sustainability literate have been established, the course design process follows standard good practice.⁴⁰ The sustainability competencies are translated into desired learning outcomes that also take into account specialist aspects of the course, the level at which it is to be pitched, and any professional standards that need to be met. At the same time the appropriate knowledge, understanding and skills to be covered are identified, as are the assessment procedures.

Levels of competency

There are two levels of competency that we elaborate upon below:

- in relation to sustainable development
- in relation to the learner's likely sphere of influence in the future.

While the difference between the two is important, they should be considered in tandem. A considerable amount of iteration is desirable between defining competencies, setting learning outcomes, identifying relevant knowledge, understanding and skills and designing the assessment procedures.

The Learner Relationship Profile can be a useful tool to work out what is sufficient in terms of sustainability literacy.

Figure 4.
Learner Relationship Profile for an architect



For example, to become sustainability literate, an accountant may have to understand and be able to apply environmental or sustainability accounting and non-financial risk management techniques. A chartered engineer may be expected to know about the existence of this type of accounting practice and have an idea of how it can help in cost-benefit analysis of any project. But a sustainability competent car mechanic would not be expected to master these accounting

⁴⁰ See for [example www.qaa.ac.uk](http://example.www.qaa.ac.uk)

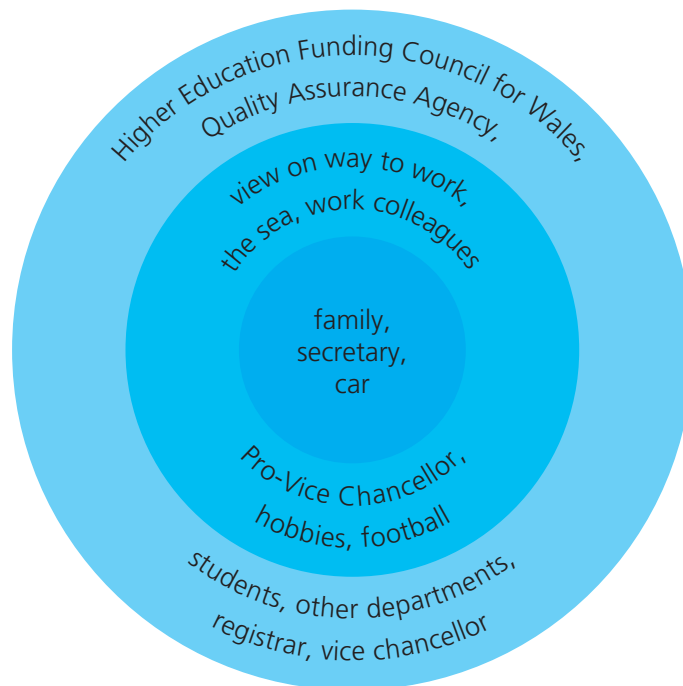


techniques (unless they were training to set up their own business). However, they might be expected to be competent in how to specify for supplies with low or no environmental or social impact, and how to manage different waste streams.

The level of competency also needs to be established in relation to the graduates' likely area of work and sphere of influence in the future. For example, an architect may have influence with clients in terms of the initial design of a construction, and with contractors in terms of what materials and technologies to use. (See Appendix A.)

An academic secretary may have influence with colleagues and practice in the workplace (including the vice chancellor), but influencing the Higher Education funding agencies or quality assessment agencies may be beyond his or her scope.

Figure 5.
Learner Relationship Profile for an academic secretary



Writing learning outcomes

The learning outcomes related to sustainable development should be embedded and expressed in the same style as other learning outcomes for the course. Outcome based learning with an explicit and logical path between intended outcomes and results is essential to achieve excellence in teaching and assessment of a non-discipline such as sustainable development. Examples of learning outcomes that are designed to achieve sustainability competence or literacy are shown in box 12.



Box 12.

Examples of learning outcomes

Students should be able to:

- discuss both the practical and ethical dimensions of the pursuit of sustainability (University of St Andrews first year module)
- identify in broad terms the global footprint of, and the ethical/value system implicit in, their working environment (Leeds Metropolitan University engineering module)
- have awareness of the rural environment as an amalgam of natural, social and economic attributes and forces, providing a complex context for instigating appropriate change (University of Aberdeen MSc)
- identify the opportunities and constraints for implementing sustainability solutions in different sectors, and critically evaluate what constitutes best practice (Forum for the Future MProf).

See pages 23–27 for further details of these courses.

Determining knowledge, understanding and skills

Having identified relevant competencies and learning outcomes, the next step is to set out the appropriate knowledge, understanding and skills to be covered for students to become sustainability literate.

As a reminder (see section 3.3 page 37) you need to consider:

- professional specific knowledge, understanding and skills
- professional transferable knowledge, understanding and skills
- personal transferable knowledge, understanding and skills.

Once again it might be helpful to refer back to the Learner Relationship Profiles. Ideally, the process should involve students, graduates, employers and colleagues from other departments to ensure that the body of knowledge, understanding and skills is relevant and enables students to explore the environmental, social and economic perspective at the same time.

Teachers can mediate a discussion that will establish the set of knowledge, skills and understanding:

- that the group or individual has already
- that the group needs to acquire during the course
- that are also relevant but outside the scope of the course (and may be acquired later).



Forum for the Future Sustainability Syllabus Box 4, page 14.




Designing assessment procedures

“Assessment is the single most powerful influence on learning in formal courses and if not designed well, can easily undermine the positive features of an important strategy in the repertoire of teaching and learning approaches.”⁴¹

Courses will have to meet a range of quality standards. Not all of which will be geared to assessing competence in sustainable development. Obviously, students must be equipped in a way that meets the needs of all assessment bodies (eg Qualifications Assessment Authority), or professional bodies (eg Institute of Civil Engineers).

Currently, there are no formal quality assurance benchmarks for sustainable development for post-16 study, whether for stand-alone courses, or the sustainable development element of courses in various disciplines. Therefore, colleges and universities may wish to devise their own standard of sustainability competence.

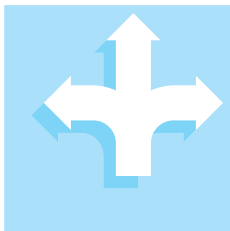
 examples from Cambridge Programme of Industry on page 24 and the Professional Engineering Competencies in Box 10 on page 38.

As identified in section 2.6, following and enhancing good learning practice is a core principle of courses that aim to produce sustainability literate graduates. Consequently, assessment should follow current best practice with its emphasis on formative feedback, rewarding rigorous analysis and multiple forms of assessment (peer, self, written, oral, presentation).

⁴¹ Boud, D. et al, “Peer Learning and Assessment” in *Assessment and Evaluation in Higher Education*, 24, 4 (1999) 413-426.

3.5

Deciding on the best delivery methodology



Perhaps the only certainty in the complex world of learning theory is that people learn through a variety of means, and individuals will have different styles of learning that suit them best.

It is likely that course designers using this guide will have a range of teaching skills and will be able to draw on resources either in their institution or professional association.

It might be helpful to reflect on the following points made by Polly Courtice, Director of the Cambridge Programme of Industry. Bearing in mind the importance of coherence between the desired learning outcome, learning methods used and achieved outcomes, and recognising that in the real world learning methods will be subject to a number of constraints, such as time, location, human or financial resources:

- learning is more or less continuous and anchored in work
- much of the learning inside an organisation occurs informally, rather than through training interventions
- experience, experimentation and failure within supportive environments are powerful ingredients of learning
- people learn extensively and continuously by observing and interacting with each other
- the person best able to act upon their learning requirements is the learner themselves
- self-driven achievement is a powerful motivator of learning.⁴²

Box 13.

Classifying learning theories

The Chartered Institute of Personnel and Development, a professional body for those involved in the management and development of people, was commissioned by the Cambridge Programme of Industry to research how people learn.⁴³ The remit was to attempt to summarise the huge amount of research that has been completed over the last 50 years and to reflect on it. The summary is recommended, as the full report is a long read.

The report marshals learning theories into four clusters:

As behaviour

Reinforcing learning - rewarding good behaviour so the individual performs the action again and again.

As understanding

Cognitive learning - internalising the principles, connections and facts about the world around us.

As knowledge construction

Subjective learning – assigning meaning to learning obtained through own experience.

As social practice

Social interaction makes learning more effective (eg children learning from interacting with adults, apprentices learning from being with masters).

www.cipd.co.uk

⁴² Polly Courtice presentation to Forum for the Future Business Network Seminar, June 2002.

⁴³ Chartered Institute of Personnel and Development, *How do people learn? The change agenda*. London: CIPD, March 2002.

3.6

Promoting the course



“More and more companies like ours are looking for multidisciplinary people.... We need fewer world class specialists than broadly based people”

Major aerospace and power company⁴⁴

It is very likely that more than one department will be involved in delivering a course that incorporates sustainable development. The examples on pages 23-27 show that there may even be input from other parts of the university community, such as the estates department, associated research centres, local industry and possibly the local community organisations. For this reason, time and effort needs to be dedicated to effective promotion of the course, not only to attract students who may be searching in the traditional locations but also to keep all those involved in delivering the course engaged in its development. This includes the professional associations who may be accrediting or validating the course.

Effective promotion of a sustainable development course can have enormous and surprising benefits. The University of St Andrews anticipated a cohort of 25 students for their first run of their undergraduate module Sustainability: Ensuring our common future. However, after ensuring the module was made prominent in the prospectus, they ended up with 75 students signing up to the course.

Institutions are advised to make best use of the communications support systems they may have access to, or buy in professional help to promote their courses. Again, do not underestimate the talents of students and graduates in helping to design prospectuses and guidelines, and promote the course through their own networks.

The words of the late Colin Bell, a former vice-chancellor of University of Stirling, are worth recalling when thinking about promoting courses with sustainability objectives. He pointed out that students are no longer passive if they find a gap between the expectations raised in a prospectus and the reality when they arrive in the institution. Instant communication between students in the same institution or with friends in other institutions, backed up by web-facilitated critiques of courses, means moves within or between institutions can be done quickly and easily compared to even three years ago.⁴⁵

⁴⁴ Quoted from Birmingham University's Special Technology Programme prospectus, available at www.eng.bham.ac.uk.

⁴⁵ Interview with Sara Parkin, August, 2002.



Many institutions may need to look for 'hidden treasure' in order to be able to promote the sustainability literacy which may already exist in certain areas of the curriculum. The University of Aberdeen, who already use an e-logo in their prospectus to highlight courses with an environmental component (see Figure 6) are now considering ways of identifying courses that make a contribution to sustainable development.

Figure 6.
The University of Aberdeen e-logo



Forum for the Future facilitated a workshop with the sustainability co-ordinator and lecturers from the University of Aberdeen from the departments of Engineering, Accountancy and International Relations to look at how the curriculum should be reviewed for its contribution to sustainable development. It was agreed that a review should be:

- discipline specific and undertaken at programme or school level
- explored by the teaching academics themselves rather than being audited against a check-list
- linked to university policy and procedures.

One suggested mechanism for the review was to ask how courses being proposed for validation or re-validation contributed to the institution's sustainability policy. This could be relatively easy to initiate, (by adding a new box on the course proposal form), unearth existing activity; and inspire debate about how the curriculum contributes to sustainable development across the institution.

Box 14.

Communicating for sustainability

Using a standard model for designing a good communications strategy is particularly helpful when thinking about promoting your course. The steps below give some tips on how to do this.

Step 1

Aim – what is the overall objective of your communication?

As with marketing any course, the overall aim of your communication is likely to be to recruit students. However there may be other objectives, such as demonstrating to funders how your institution is contributing to sustainable development, or highlighting the links between research and teaching.

Step 2

Markets – who are you saying it to?

Consider that the course may attract students from a variety of disciplines, which means that you may need to cast a wider net when marketing, and monitor where your students come from each year. Introductory modules tailored to different disciplinary backgrounds may be needed to bring students from single disciplinary backgrounds up to the same level, particularly with postgraduate courses.

Step 3

Messages – what are you saying?

Sustainability literacy is about being equipped to live and work in an ever changing world. Highlighting the employability benefits of the course is useful, but don't underestimate the values of those students who are driven by a desire to make a difference to society. Making links with the university's own sustainability strategy can also be useful.

Step 4

Methods – how are you saying it?

A combination of the usual communication channels such as prospectuses, newspapers, websites, course catalogues and posters should be complemented with informal techniques such as word of mouth or, for example, using the campus as a live case study in the course. Remember to minimise resource use, maximise innovation, be accessible, cost effective and stay true to the values of the course.

Step 5

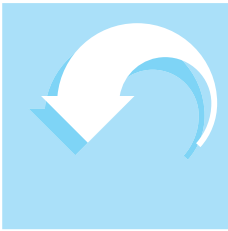
Measurement – did the communication work and how can it be improved?

Ask employers and graduates how effectively they felt the course was promoted. Being on top of changing trends in the relevant industry and new communications channels will not only keep the course up to date but also help with getting the right messages to the right people.

For further details and examples of good communication for sustainability see *Communicating for Sustainability. Guidance for Higher Education Institutions* (HEPS 2003) available from www.heps.org.uk.

3.7

Reviewing and renewing the course



No course should remain static. Whatever the subject or discipline, the relevant knowledge, understanding and skills are always changing through new research outcomes or insights as well as the inevitable changes in the world and in society itself.








Similarly, the understanding of what does and doesn't contribute to sustainable development is continually improving - through applying learning gained from a combination of intellectual effort and practical experience of what does and doesn't work. Any course should therefore ensure that its review process keeps its provision at the cutting edge of where current thinking and practice are, especially in sustainable development.

It should not be a mammoth effort to capture the new learning appropriate to any individual course. Again, ideally, the review process should include representatives from

- current students
- past student cohorts (in a range of work and personal situations)
- a range of potential and actual employers of graduates
- the discipline under consideration (home and other institutions) as well as other appropriate disciplines
- any professional standard or academic quality setting bodies.

A good review framework for the group to use would ideally refer back to the intended outcomes for each step of the course design. In the example provided in Box 15, some of these questions are closed, but the review should add appropriate why, what or how questions to both yes and no answers.

Box 15 A framework for reviewing a course for its sustainability competencies

Step	Review questions based on the desired outcomes of each step
1  Map the learner's world and establish a relationship profile	<ul style="list-style-type: none"> • Is the world map for an 'average' graduate of this course still the same? • Are there any new relationships to add to the profile?
2  Make ethics and values explicit	<ul style="list-style-type: none"> • Is the course delivered in a way that is compatible with the values made explicit at the outset – in what the course teaches, as well as in how it is taught? • Does the ethical framework or set of values need to be changed?
3  Identify sustainability competencies	<ul style="list-style-type: none"> • Were the sustainability competencies adequately derived from the learner relationship profile for: <ul style="list-style-type: none"> • professional specialist needs • professional transferable needs • personal needs?
4  Identify learning outcomes, specific knowledge, understanding and skills and assessment procedures	<ul style="list-style-type: none"> • Were the learning outcomes relevant: <ol style="list-style-type: none"> a) For the level of the course? b) In relation to the competencies? c) In relation to the knowledge, understanding and skills? d) In relation to the assessment procedure? • Were the knowledge, understanding and skills sets right: <ol style="list-style-type: none"> a) For the learning outcomes? b) In relation to the competencies? • Did the assessment procedure fit logically with the learning outcomes and the learning methods, professional and other quality standards?
5  Decide on the best delivery methodology	<ul style="list-style-type: none"> • Was the learning process of the course effective overall? • Were the different elements mutually reinforcing? • What approaches worked well and not so well?
6  Promote the course	<ul style="list-style-type: none"> • How did the students find out about the course? • What (if anything) in the published material (written, web) attracted students to apply? • How do employers, graduates and others view the course's contribution to sustainability literacy?
7  Review and renew the course	<ul style="list-style-type: none"> • Was the outcome of the previous review incorporated into the course appropriately? • Are the above questions and processes adequate to reviewing and renewing the course and how might they be improved? • Are there other courses to compare with, or new people to include in the review process? • Is there any way the course itself, and/or the design and review process, might help others to stand on the shoulders of our experience and quickly move to producing sustainability competent or literate graduates themselves? (In the UK or overseas.)

Section 4 The future for learning and skills for sustainable development

This guide is being published at the end of the Higher Education Partnership for Sustainability. It is part of a series of guides that includes:

Purchasing for Sustainability: Guidance for Higher Education Institutions, February 2003.

Travel Planning for Sustainability: Guidance for Higher Education Institutions, May 2003.

Accounting for Sustainability: Guidance for Higher Education Institutions, November 2003.

Reporting for Sustainability: Guidance for Higher Education Institutions, November 2003.

Communicating for Sustainability: Guidance for Higher Education Institutions, February 2004.

HEPS has also developed an online sustainability reporting system, HEPS RT, which enables institutions to monitor their contribution to sustainable development, set targets for improvement and compare performance with others. HEPS RT creates a sustainability profile of the institution which can help communicate progress.

Copies of the guides are available from Forum for the Future or can be downloaded from www.heps.org.uk. If you are interested in finding out more about sustainability reporting or would like to use HEPS RT please contact Forum for the Future.

Obviously, the work we have done on the curriculum is central to our vision for accelerating change to a sustainable way of life. So developing and sharing ways of integrating sustainable development into all sorts of educational provision is a top priority for us.

We are keen to carry on working in partnership with others to develop and test the tools we have described in this guide and to build up a stock of examples of good and new practice that can inspire and support people tackling the challenge for the first time.

Forum for the Future will be continuing its work through the Leadership and Skills for Sustainable Development partnership initiative (see Box 16) that will support organisations in setting sustainability policy and frameworks and designing tools for implementation. Because much of our learning from the HEPS programme is transferable, and because of the changes taking place in the post-16 education sector, we are extending our partnership, to bring in further and other adult education sectors, as well as bodies concerned with professional and academic quality standards.

Box 16.**Leadership and Skills for Sustainable Development (LSSD)**

The aim of the programme is to build the capacity of, and to otherwise generally support, the leadership of those organisations in integrating sufficient knowledge and understanding about sustainable development into their policy and practice.

The outcome will be sustainability 'literate' organisations able to specify for and/or supply the knowledge and skills people need to act and make decisions in a way that favours sustainable development. Also, and on the demand side, to be sustainability 'literate' or 'competent' will be viewed by employers as well as society in general to be a desirable and normal attribute of anyone leaving the formal educational system.

The means for achieving this outcome will be led by the partner organisations themselves, enabling them to own the process and tailor it to the different needs of their various organisations and stakeholders. Forum for the Future will bring its expertise in sustainable development to the partnership, adding its experience in supporting organisations in different sectors (eg government at all levels, business, higher education, professional bodies) as they integrate sustainability into their policies and practice in a coherent and consistent way.

For more information please contact heps@forumforthefuture.org.uk

Appendices

A Curriculum design tools (blank and with examples)

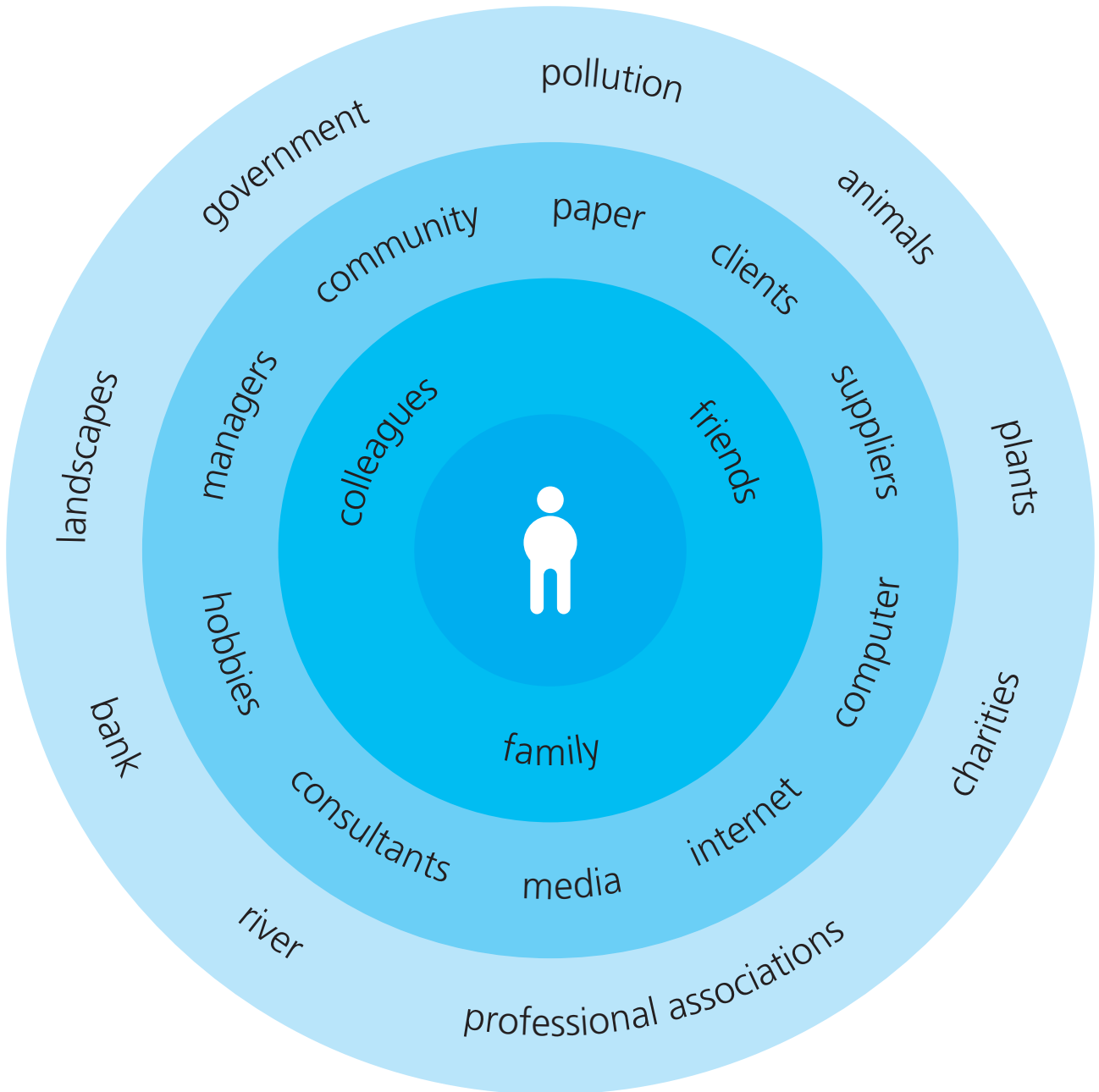
Learner Relationship Profile

Values Audit Table

Sustainability Competencies Matrix

B Sustainability Appraisal Grid

Appendix A
Learner Relationship
Profile (example)

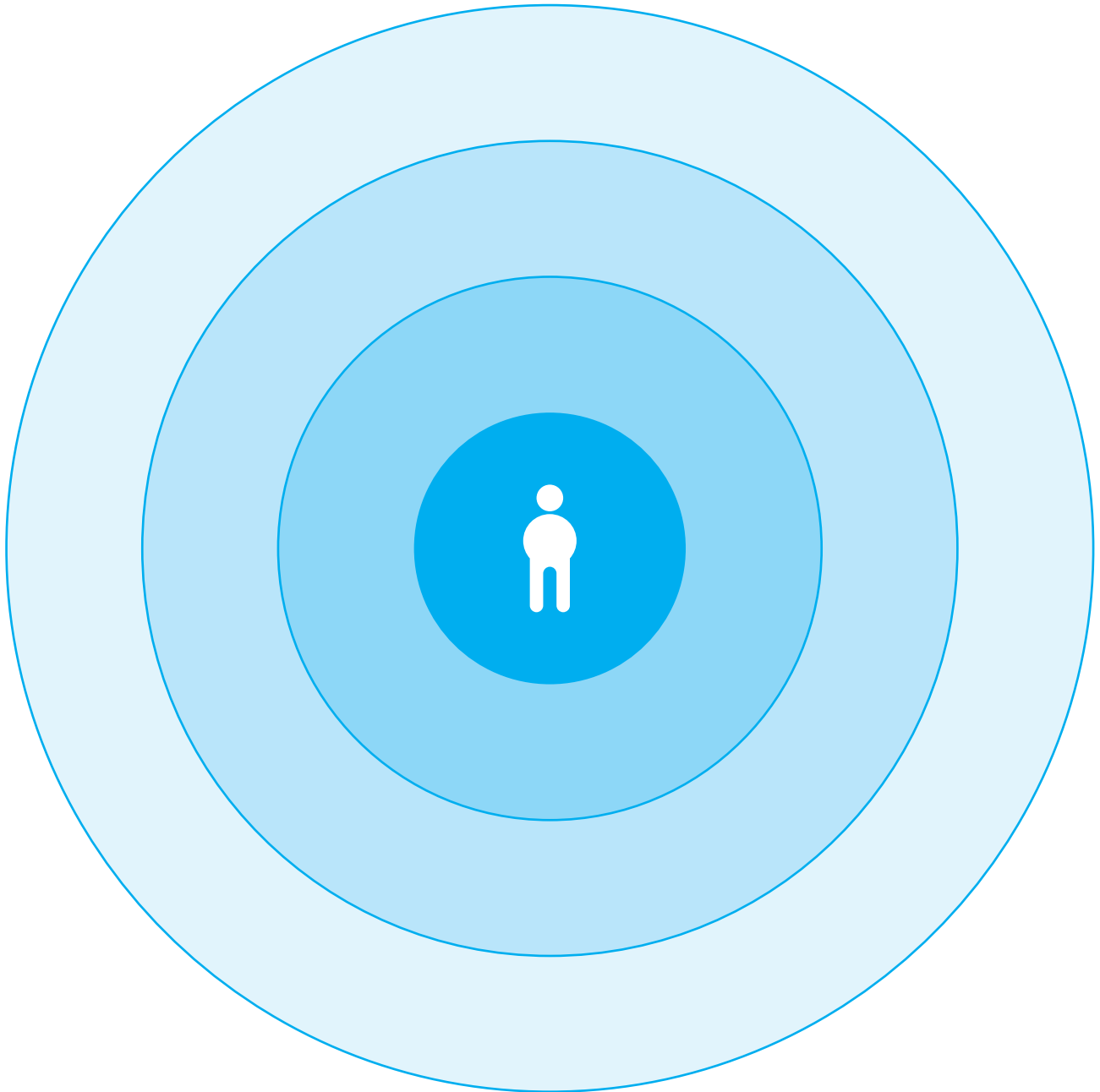


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Learner Relationship Profile



Map the learner's relationships in the circles, with the most important relationships at the centre, working outwards to less central (but still important) relationships in the outer circles. Include professional and personal relationships with individuals, organisations, significant objects and the physical environment.



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**Values Audit
Table (example)**



This is a framework to check whether a course is being delivered in a way that complements the agreed values of the institution and learners and whether the course itself reflects those values. The values below are those of Forum for the Future, however the values used need to be pertinent to both learners and teachers. This table can be used to note the contribution the course is already making and to suggest ways of improving the course to better reflect the agreed values.

Does this course motivate staff and students to...	Score (1-5) and suggestions for improvement
Commitment and co-operation	
Take the opportunity to realise their potential?	
Inspire and motivate each other?	
Respect and integrity	
Appreciate and celebrate the interconnectivity of human, social and natural systems?	
Value the richness brought to learning by diversity of cultures, backgrounds, opinions and ideas?	
Work in an environment in which people feel able to express differing views openly?	
Fairness	
Promote the principles of equity and justice?	
Honesty and openness	
Recognise mistakes and learn from them?	
Compassion	
Be mindful of the effects of their actions on each other and on their environment?	
Fun	
Have fun. Appreciate humour and create an enjoyable and friendly working environment?	



Values Audit Table



1. Note the values that the students and staff feel should be incorporated into the way the course is delivered.
2. For each value note the actions that students and staff could take to help promote this value.
3. Give a score for how you are doing now (1-5) and make a suggestion for improvement.
4. Revisit your values and actions as often as appropriate.

Does this course motivate staff and students to...	Score (1-5) and suggestions for improvement
Value:	
Action:	
Action:	
Value:	
Action:	
Action:	
Value:	
Action:	
Action:	
Value:	
Action:	
Action:	



**Sustainability
Competencies Matrix
(example)**

This matrix has been informed by a learner relationship profile of a practicing architect and the Architect Registration Board qualification criteria.⁴⁶



What should an *architect* be sufficiently good at or able to do to manage his/her relationship with a *building contractor* and a *local authority planner* in a way that maintains or enhances the resources or capitals available to us?

The five sets of resources (or capitals) that need to be in good shape to deliver a flow of benefits.	Competency
<p>NATURAL CAPITAL The resources and services provided by the natural world.</p>	<p>Explain how to minimise the consumption of resources through effective choice of technology, design and materials in a way that enhances the local landscape.</p>
<p>HUMAN CAPITAL The energy, motivation and capacity for making relationships, and the intelligence and health of individuals.</p>	<p>Create quick visualisations of a building design and landscape that promote human health and be able to communicate this to different audiences in a convincing way.</p>
<p>SOCIAL CAPITAL The social groupings that add value to individuals (eg families, communities, parliaments, universities).</p>	<p>Create an accessible design that promotes interaction between different parts of the community and contributes to the urban (or rural) physical and social fabric.</p>
<p>MANUFACTURED CAPITAL The material and infrastructure that exists already – buildings, IT systems, railways etc. Can it be used in a way that requires fewer resources and more human creativity?</p>	<p>Apply techniques to balance effective management of resources with rational infrastructural and logistical implications of implementing a design.</p>
<p>FINANCIAL CAPITAL The money, stocks etc that enable us to put a value on, and buy and sell, the above resources. Are there ways that value can more accurately represent the real cost of using them?</p>	<p>Incorporate a whole life costing approach into the design, using renewable and recyclable resources and identifying links between sustainability and improved performance in the construction industry.</p>

⁴⁶ www.arb.org.uk

**Sustainability
Competency
Matrix**

Use this matrix to help identify the high level sustainability competencies for a graduate of any discipline.

Refer back to your Learner Relationship Profile to help fill in this table.



What should a <i>(insert discipline here)</i> graduate be sufficiently good at or able to do to manage his/her relationships with <i>(insert key relationships from profile here)</i> in a way that maintains or enhances the resources or capitals available to us?	
The five sets of resources (or capitals) that need to be in good shape to deliver a flow of benefits.	Competency
<p>NATURAL CAPITAL The resources and services provided by the natural world.</p>	
<p>HUMAN CAPITAL The energy, motivation and capacity for making relationships, and the intelligence and health of individuals.</p>	
<p>SOCIAL CAPITAL The social groupings that add value to individuals (eg families, communities, parliaments, universities).</p>	
<p>MANUFACTURED CAPITAL The material and infrastructure that exists already – buildings, IT systems, railways etc. Can it be used in a way that requires fewer resources and more human creativity?</p>	
<p>FINANCIAL CAPITAL The money, stocks etc that enable us to put a value on, and buy and sell, the above resources. Are there ways that value can more accurately represent the real cost of using them?</p>	



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Appendix B
Sustainability Appraisal
Grid (example)

What can the university do to enhance the stock of the following resources or “capitals”?



Three ways in which a university manifests itself			
	As a business	As a place of learning and research	As a key member of the community
<p>NATURAL The resources and services provided by the natural world.</p>	<p>1. Use resources efficiently</p> <ul style="list-style-type: none"> • Reduce energy and raw material use • Drive waste out of the system. 	<p>2. Develop the new economy</p> <ul style="list-style-type: none"> • Exploit teaching, research, business development opportunities in low-carbon, high human creativity economy. 	<p>3. Conserve, enhance the environment</p> <ul style="list-style-type: none"> • Subscribe to low-impact travel schemes • Increase biological mass and diversity (on campus and locally).
<p>HUMAN The energy, motivation and capacity for relationships, and intelligence and health of individuals.</p>	<p>4. Attract and keep good staff</p> <ul style="list-style-type: none"> • Create community of purpose for staff, students, other stakeholders • Be a values led organisation • Ensure healthy working culture and physical environment • Be active on diversity. 	<p>5. Provide good student experience</p> <ul style="list-style-type: none"> • Be a values led organisation • Ensure healthy working culture and environment (a new “conviviality” quotient) • Enhance employability of graduates • Ensure sustainability literacy for all. 	<p>6. Promote Life Long Learning</p> <ul style="list-style-type: none"> • Mix on/off campus learning experiences for both students and community (work-based learning) • Clear learner paths in and out of higher education – from school, further education, work, non-working.
<p>SOCIAL The social groupings that add value to individuals (eg families, communities, parliaments, universities).</p>	<p>7. Provide good governance, management</p> <ul style="list-style-type: none"> • Ensure clarity and coherence in strategic planning and well trained managers • Modernise charters, decision-making systems to ensure transparency and democracy. 	<p>8. Anticipate future markets for graduates</p> <ul style="list-style-type: none"> • Articulate and meet 21st century challenges through teaching, research & knowledge transfer • Promote a vision of future that engages new generations • Prepare graduates for multi-disciplinary approaches to problem solving. 	<p>9. Respond to other policy agendas</p> <ul style="list-style-type: none"> • Ensure equal opportunities/access, and other human rights • Understand employer demand in context of future needs • Renew purpose of an institution • Provide leadership for society in complex, rapidly changing times • Higher education to set as well as respond to agendas.

What can the university do to enhance the stock of the following resources or “capitals”?



Three ways in which a university manifests itself			
	As a business	As a place of learning and research	As a key member of the community
<p>MANUFACTURED The material and infrastructure that exists already: buildings, IT systems, railways etc. Can it be used in a way that requires fewer resources and more human creativity?</p>	<p>10. Demonstrate best value in use of estates</p> <ul style="list-style-type: none"> • Ensure building design, refurb, all estate management is best practice for purpose and for environment • Forge local partnerships (eg renewable energy generation). 	<p>11. Excellence in research and teaching</p> <ul style="list-style-type: none"> • Integrate student learning with campus improvement and community experience • Sustainability research/ consultancy • Encourage innovation for sustainable design solutions. 	<p>12. Promote community relations, outreach</p> <ul style="list-style-type: none"> • Share sports, library other facilities • Build portfolio of joint ventures for student, staff and local residents • Sustainable transport partnerships.
<p>FINANCIAL The money, stocks etc. that enable us to put a value on, and buy and sell, the above resources.</p>	<p>13. Save money/ be efficient</p> <ul style="list-style-type: none"> • Use whole life costing • Invest ethically (eg pensions) • Provide incentives for adding value to physical resources. 	<p>14. Compete internationally/ regionally</p> <ul style="list-style-type: none"> • Structure internally and make relationships to facilitate ideas-innovation-implementation process • Export models and programmes. 	<p>15. Modernise risk management</p> <ul style="list-style-type: none"> • Report on environment and social impacts as well as financial • Use procurement strategies to support local markets and ethical trade.



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**Sustainability
Appraisal Grid**

Use this grid to help identify how your institution (or individual activity) is contributing to sustainable development, or how it might do so in the future.

What can the university (or activity) do to enhance the stock of the following resources or "capitals"?



	Three ways in which a university manifests itself		
	As a business	As a place of learning and research	As a key member of the community
<p>NATURAL The resources and services provided by the natural world.</p>	1.	2.	3.
<p>HUMAN The energy, motivation and capacity for relationships, and intelligence and health of individuals.</p>	4.	5.	6.
<p>SOCIAL The social groupings that add value to individuals (eg families, communities, parliaments, universities).</p>	7.	8.	9.

Are there ways that value can more accurately represent the real cost of using them?

What can the university (or activity) do to enhance the stock of the following resources or "capitals"?



	Three ways in which a university manifests itself		
	As a business	As a place of learning and research	As a key member of the community
<p>MANUFACTURED The material and infrastructure that exists already: buildings, IT systems, railways etc. Can it be used in a way that requires fewer resources and more human creativity?</p>	10.	11.	12.
<p>FINANCIAL The money, stocks etc. that enable us to put a value on, and buy and sell, the above resources.</p>	13.	14.	15.

The boxes have been numbered for ease of reference when using the grid.



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