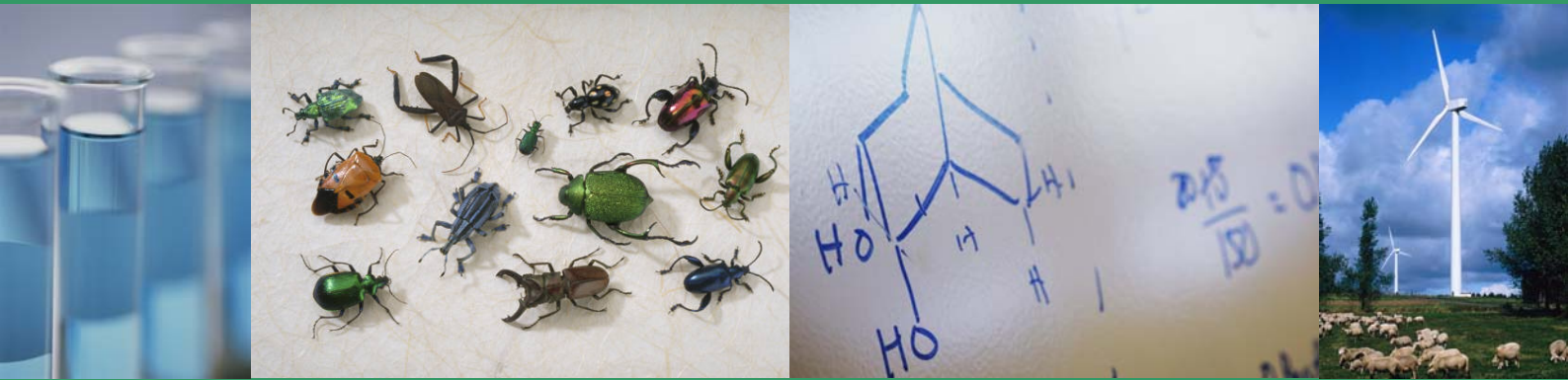


Baseline Evaluation of Education for Sustainable Development (ESD) in the Biosciences



A report of a survey of higher education teaching staff and bioscience employers

May 2005



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Executive Summary

HEFCE recently published a consultation document “Sustainable Development in Higher Education - Consultation on a support strategy and action plan” (www.hefce.ac.uk/pubs/hefce/2005/05_01/)

One of the aims of the action plan is to “develop curricula, pedagogy and extra-curricular activities that enable students to develop the values, skills and knowledge to contribute to sustainable development”. HEFCE has stated its objective to “support the Higher Education Academy to identify, share and augment good practice in curricular and pedagogical developments”.

The Centre for Bioscience’s first activity in this pilot project is to collect details of existing practice and resources in UK bioscience departments. To complement this we have collected views from a small number of employers of bioscience graduates in order to include their views of the importance of the sustainability knowledge and skills which bioscience graduates need now and for the future. This data has been used to provide a baseline evaluation of ESD in the biosciences.

To summarise our findings:

- 82% bioscience academics thought it important for young people to have an understanding of sustainable development;
- half of bioscience academics considered that sustainable development should be a compulsory part of bioscience courses whilst half were unsure or against its inclusion in the curricula;
- whilst staff had knowledge and skills to teach sustainable development more training and resources were suggested as a way of increasing teaching;
- lack of time and finance were seen as problems to introducing or increasing teaching of sustainable development;
- half of employers considered it “very important” for graduates to have an understanding of sustainable development;
- half of employers considered that graduates who had knowledge of sustainable development would improve their competitiveness; and
- all employers thought that graduates would need knowledge and skills of sustainable development.

Background

The report “Our Common Future” put issues of sustainable development on the international agenda (Brundtland 1987). The report defines sustainable development as *development that meets the needs of the present without compromising the ability of future generations to meet their own needs*. This concept now underpins much of the thinking and policy related to sustainable development and the concept now forms a key pillar of Government policy. In December 1999 the UK Government published the ‘Quality of Life Counts’, a core set of 147 indicators of sustainable development to be used to monitor national progress towards a more sustainable society (DETR, 1999). Data has been published on national trends in these indicators since 1999, with comparisons available between 1970 and 1990 values (DEFRA, 2002). A range of Government policy initiatives are now in place to take forward and heighten awareness of sustainable development¹. It is recognised that both schools and universities have a key role in “education for sustainable development” and both DfES and HEFCE have strategy documents relating to the subject^{2 3}.

This report outlines the findings of questionnaire surveys undertaken with Bioscience Representatives in departments and with employers of bioscience graduates. These surveys were undertaken to provide an overview of ESD in the bioscience community as a basis for the planning of future activity and to identify opportunities for the Centre for Bioscience to support its academic community. The surveys enabled the Centre for Bioscience to identify issues raised by bioscience academics and employers, resources in the teaching of ESD in the biosciences (appendix 3) and to provide a position statement on ESD in the biosciences. An overview of the findings of the two surveys is provided and conclusions drawn about the opportunities for the Centre for Bioscience in relation to future developments in this area.

Survey of Bioscience Representatives

An on-line questionnaire (appendix 1) was sent to 150 Bioscience Representatives in a range of institutions throughout the UK in March 2005. Recipients were able to forward the e-mail to another member of their department if they did not feel able to complete the questionnaire. Six contacts are known to have done this and overall nine of the respondents were not Bioscience Representatives. The 33 responses (22% response rate) have been anonymised.

Respondents were from a wide range of departments including: Biological Sciences, Agriculture, Anatomy, Biomolecular Sciences, Pharmacology, Plant Sciences, Physiology, Life Sciences and Food Sciences.

The questionnaire was divided into four sections:

- Personal details (name, e-mail, department, institution);
- General questions about sustainability;
- Review of current practice of ESD in disciplines; and
- Identification of ESD in other disciplines.

¹ www.defra.gov.uk/environment/sustainable/index.htm

² www.hefce.ac.uk/pubs/hefce/2005/05_01/

³ www.teachernet.gov.uk/_doc/5295/Sus_Report_Single.pdf

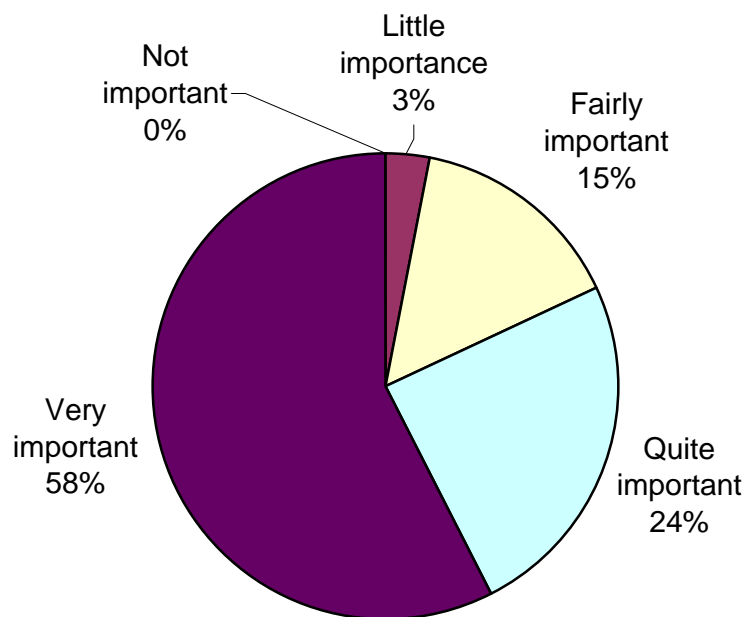
Section 1 - General questions about sustainability

1a) Please comment on your understanding of what the term Sustainable Development (SD) means.

Respondents' understanding of the term "Sustainable Development" was varied. 12% said they had a high or good understanding of SD and 12% saying they have no idea at all. 13% of respondents thought the Brundtland definition ("development that meets the needs of the present without compromising the ability of future definitions to meet their own needs"), to be a reasonable definition of SD. All the remaining respondents gave their own definition of SD. Of these respondents 48% (38% overall) had a similar definition to that of Brundtland. A minority (9%) of respondents thought that SD was a contentious issue, too involved with politics and too highly contested.

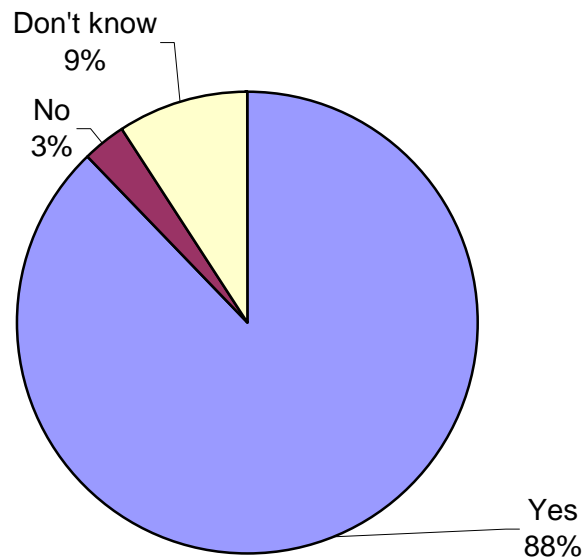
Figures ⁴ 1b and 1c illustrate that 82% of respondents believed that it was either "very important" or "quite important" for young people to have a good understanding of SD and that 88% thought that Higher Education Institutions (HEIs) have a role in developing societal understanding of sustainability.

1b) How important do you think it is for young people to have some understanding of SD?



⁴ Where a figure number is given this refers to the question number, i.e. figure 1b shows the responses to question 1b

1c) Do you think HE should play a role in helping society to develop sustainability?



1d) How do you think HE can contribute to a greater understanding of SD?

A wide variety of suggestions were given;

- “Two routes, firstly education secondly research”
- “Create awareness of the problems”
- “Setting a model of practice as an organisation”
- “Contextualise and integrate SD with existing subject material”

Many offered teaching as a way that HE could increase the understanding of SD. SD could be embedded within modules, both in “appropriate award programmes” and into a wide range of courses, and also taught as part of generic skills modules to reach a wider audience of ‘non-scientists’ and raising the awareness of SD among students.

Embedding SD into the curriculum was also seen as important by some. A few respondents also suggested that HE could contribute to a greater understanding of SD through good practice. Research was also seen as a possible influence. Some respondents believed that instilling SD values into students should start at school and be continued into HE.

1e) How could your department or school contribute to a greater understanding of SD?

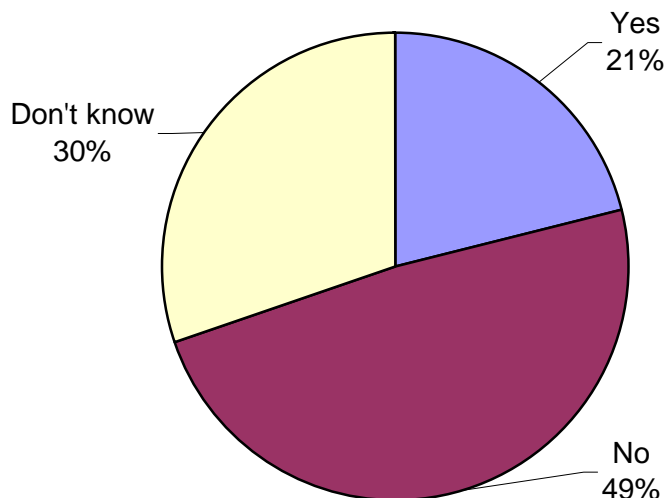
Again, the main focus of the respondents’ answers was on teaching. Increasing SD content of modules and degree programmes, including SD within the curriculum, having a specific SD module, broadening its presence within the curriculum and increasing student awareness of SD.

Research was also thought to play an important role. Good practice within the department was also seen by some to be an important aspect of contributing to a greater understanding of SD.

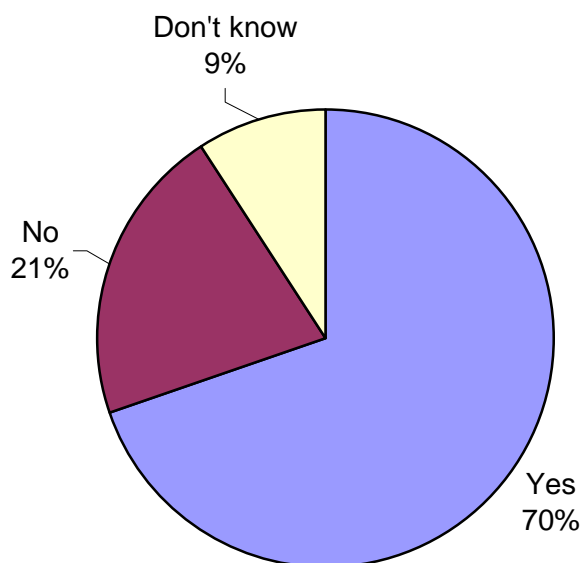
Section 2 - Review of current practice in ESD in disciplines

Figures 2a and 2b illustrate only a fifth of respondents were aware of an institutional strategy for SD, however the majority of respondents (70%) believed that ESD was relevant to their discipline. Nearly half of institutions had no SD strategy in place.

2a) Does your institution have a strategy for SD?



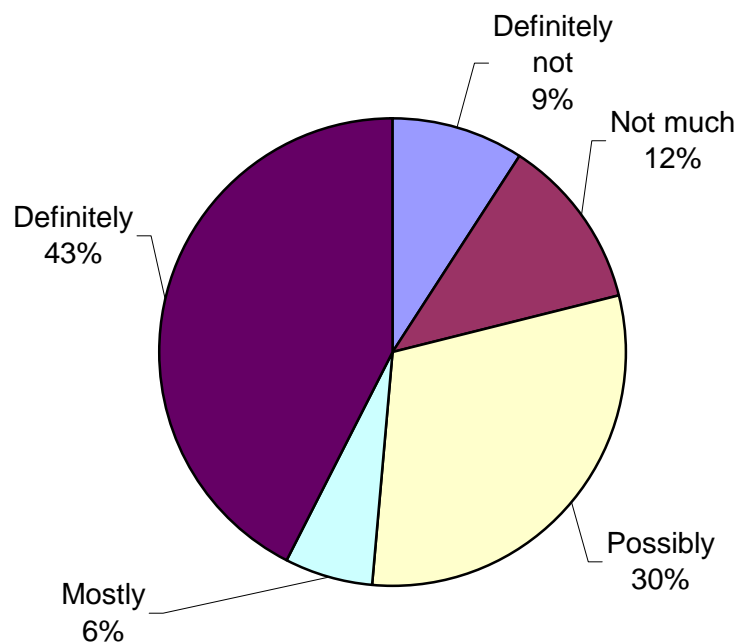
2b) Do you think the teaching of SD is relevant to your discipline?



While 21% of respondents saw SD as totally unrelated to their subject and therefore not an issue for them or their students, 70% saw it as relevant;

- “Sustainable development is not an issue for students in pharmacology”
- “I have to say that this seems to be rather peripheral to the issues that vex most academics at present. If this is what the HE Academy is thinking needs urgent attention, then I worry for the future”
- “In my particular area of Biochemistry I do not see how SD can be easily applied. However, other disciplines, like conservation studies, would have a major impact on the understanding of SD”.

2c) Do you think that SD should be a compulsory part of bioscience programmes?



While 43% of respondents believed SD should be a compulsory part of curricula, there were a greater number of respondents (51%) who were unsure or positively against its inclusion in curricula. However, figure 2d suggests that a range of issues associated with SD are already incorporated into over 60% of programmes.

2c i) Please comment on your above answer

The main problems as seen by respondents with making SD a compulsory part of the curriculum were constraints such as lack of time and space in the curriculum.

SD was seen as irrelevant on some courses, 19% of respondents thought it irrelevant in their particular subject area;

- "It may not always appear relevant to students on certain bioscience programmes".
- "Depends on the award"

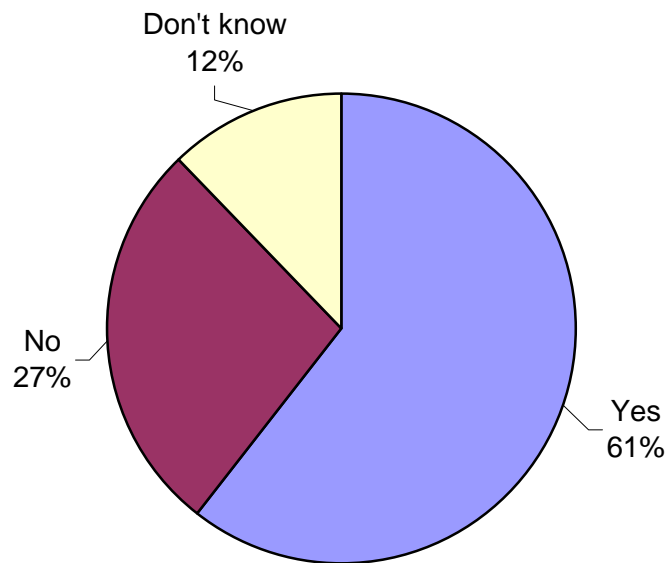
26% thought that it should be an essential part of bioscience courses or that SD was so much a part of their subject area that it should not be considered as an "add on" to the curricula but rather as an integral part;

- "SD is an integral part of many aspects of bioscience rather than a separate 'add-on'. It is an underlying philosophy rather than a topic. It is embedded in many topics, compulsion for an embedded aspect is difficult to imagine"
- "I find it appalling that students in bioscience can obtain qualifications in bioscience without knowing how their subject interacts with business and the environment."

23% thought that all graduates ought to have a general awareness of SD issues and could be included as part of the "general education aspects" of a degree;

- "It should be integrated into all courses, not just biosciences"
- "Graduates are likely to be opinion formers of the future, they should be aware of the issues and repercussions"
- "We must at least ask the question as to what impact this or that activity has or could have on SD.....This will get trainees/students at least thinking along the right lines".

2d) Are issues of SD already incorporated within your bioscience degree(s)?



2d i) If yes, how is SD incorporated (i.e. integrated within modules or a specific SD module)?

Of those respondents whose departments already incorporated SD, 90% had SD integrated within modules, 5% had specific SD modules and 5% had both. A wide variety of modules where SD was integrated were given. Examples included; Species Conservation; Population Management; Bioethics and Microbial nutrition. Some specific SD modules were also given, such as; Education for sustainability and Transport: towards a sustainable future.

In several cases SD appeared to be embedded within modules and / or degree routes where ecology and conservation were important themes.

SD was included in both undergraduate and postgraduate courses both as optional and / or compulsory modules depending on the degree route taken.

2d ii) If yes, which areas of SD are incorporated?

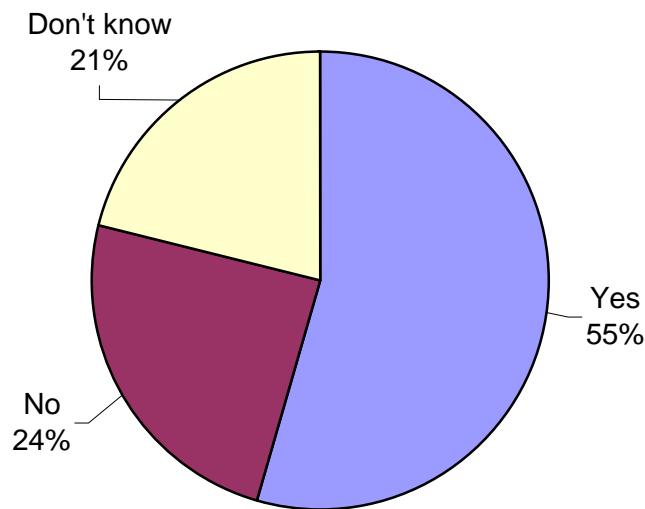
A wide variety of SD issues appeared to be incorporated into degree programmes where SD is taught, including: conservation; pollution; agriculture (e.g. crop and livestock production); natural resources; forestry; bioethics; human-environment interaction; social aspects (e.g. drug abuse); transport; environmental law; conservation policy and practice; international agreements relating to environmental policies (e.g. Rio, 1992).

2d iii) If no, which SD issues do you think should be incorporated?

Broad themes of SD were thought to be more relevant on some courses and the themes would vary according to the degree route. General SD issues such as the environment and social and economic aspects of SD were also suggested. Where specific examples were given GM, climate change, transport, housing, lifestyle and resource use aspects of SD were thought to be appropriate themes.

Some felt they did not know enough about SD to suggest issues that would be appropriate. This is reflected in figure 2e.

2e) Do you think you and your colleagues have the knowledge and skills to teach issues relating to sustainability?



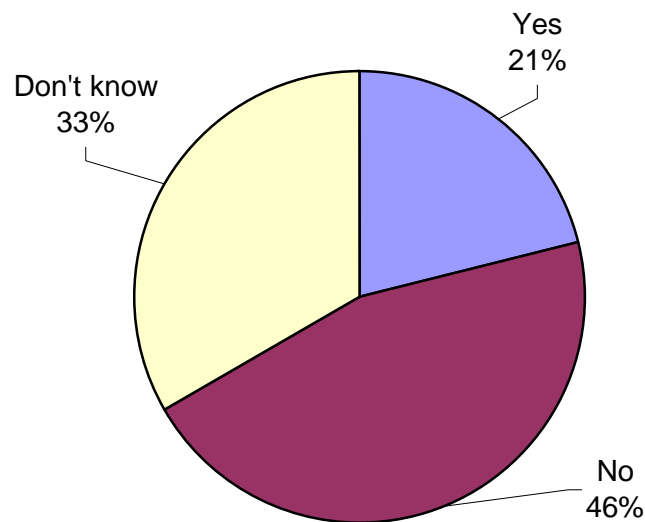
2e i) What training / support would you and your colleagues require in order to teach or increase teaching of SD?

Approximately a quarter of the respondents indicated that increasing staff awareness of SD would enable teaching or increased teaching of SD to students. Suggested ways of increasing awareness included conferences, specific training, and resources to explain SD, including terminology, definitions and facts and figures about sustainability, also training to show how SD could be integrated into modules and disciplines. Some respondents also suggested that resources for staff to use in teaching would enable teaching or increase teaching of sustainability issues, such as workshop and tutorial outlines and ideas for essays, projects and discussions.

Some respondents felt that different levels of both interest and understanding of SD issues, on both a personal and professional level, between colleagues within departments could make training or raising awareness more problematic.

- "... some of my colleagues don't believe in global warming for example, so they wouldn't be interested in reducing greenhouse emissions"

2f) Do you or your colleagues use any specific learning resources linked to the teaching of SD in the curriculum?



2f i) If you do use specific learning resources, please provide details.

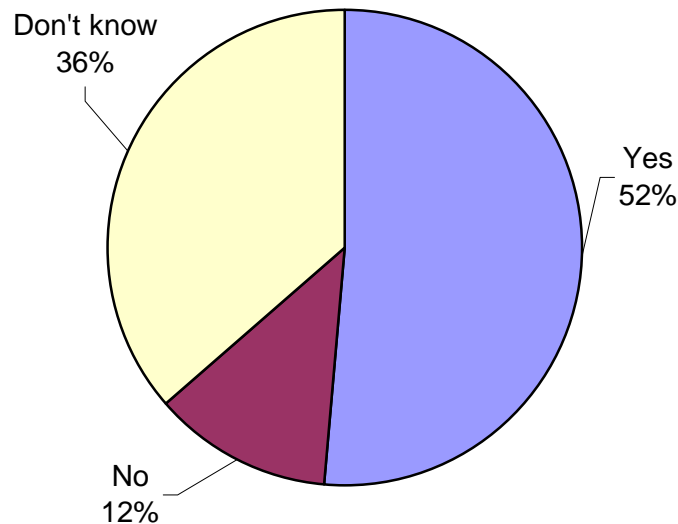
Figure 2f illustrates that only about a fifth of respondents use/or were aware of specific SD learning resources.

Approximately half of those respondents who did use specific learning resources used journal articles / research publications and there was some use of specific Environmental Science books. There was also use of online resources, including facts, figures and examples, from a wide variety of organisations, including EMAS (Eco Management and Audit Scheme), SNH (Scottish National Heritage), SEERAD (Scottish Executive Environment and Rural Affairs Department), SEPA (Scottish Environment Protection Agency), DEFRA (Department for the Environment Food and Rural Affairs), WHO (World Health Organisation) and Tearfund (A Christian Aid Agency). One respondent used field work, such as nature reserves, and another cases studies and also communication exercises on explaining aspects of SD.

Section 3 - Identification of ESD in other disciplines

Figure 3a illustrates that half of the respondents were aware of SD teaching elsewhere in their respective institutions

3a) To your knowledge do any departments or schools within your institution teach SD?



3a i) If yes, which?

A wide variety of departments were known to be teaching SD within the respondents' institution. For departments mentioned more than once the number of citations is given.

Geography (8); Specific Environmental studies schools or institutes (5); Economics (4); Earth Science (3); Biology (including life sciences) (3); Architecture (2); Built Environment (2); Business (2); Oceanography; Civil Engineering; Anthropology; Fashion and Textiles; Marketing and Tourism; Horticulture;; Sociology; Accountancy; Law; Human Science; Design; Work-Based Learning; Technology.

3b) Would you consider using staff from other departments to teach SD to bioscience students?

42% of respondents stated that they would use staff from other departments and 16% of those who replied have already done so, with two different respondents using staff from Geography and Economics departments to cover some aspects of SD in their curriculum.

13% of respondents said that they would consider using staff from other departments to teach SD to bioscience students if what they taught was relevant to bioscience students and fitted into the curriculum.

29% of respondents stated that they would not use staff from other departments, where reasons were given for not using other departments' staff the issues appeared to be of timetabling, organisation and cost.

Survey of Employers

Ten employers were contacted and asked to complete a survey (appendix 2) and of which seven replied (70% response rate). Respondents were from a range of companies and organisations including a Local County Council, the Forestry Commission and Healthcare and Pharmaceutical consultants. A variety of job types were also covered including HR Advisor, Project Manager, Environmental Co-ordinator and Scientific Researcher. Responses have been anonymised.

1) Does your organisation or company have a policy position or statement relating to sustainable development (SD)?

Six of the organisations had a policy or statement relating to sustainable development. The themes detailed in these documents were often directly related to the company or industry, for example;

- “sustainable management of woodland... protection of ecological sites and species.”
- “Assess and manage the environmental risks and effects associated with our operations”

Other, more general SD themes were present, such as ‘green / ethical’ purchasing, reduction of CO₂ emissions and addressing climate change, social aspects of SD, training and skill development, recycling and resource use and environmental impact. In many the maintenance of stable economic growth was an important theme.

2) How important do you think it is that any graduates you recruit have a broad understanding of the concept of sustainable development?

Five of the respondents thought that it was “very important” or “quite important” for the graduates they employed to have a broad understanding of the concept of SD.

3) Please suggest 3 areas of SD that would be particularly useful for graduates joining your organisation to have a good knowledge of.

It was seen as useful for graduates to have a good knowledge of a wide variety of SD issues. Both local and global SD issues were perceived to be important as well as key and current SD and environmental issues. Environmental impact issues were also seen as an area where it would be useful for graduates to have a good understanding. Sustainability legislation, targets, initiatives and audit procedures were thought to be important for some and the ability to understand how to balance economic and environmental objectives.

- “...it’s important to have a good understanding of the key current and future issues affecting us locally as well as globally. An all-round knowledge is essential”
- “... awareness of national / international sustainability targets and initiatives.”
- “The dilemma of protecting the environment in a resource constrained framework where hard choices need to be made.”

4) Do you believe that employing graduates with a good understanding of sustainable development will enhance your efficiency or marketplace competitiveness?

Three of the employers felt that employing graduates with a good understanding of SD would enhance competitiveness. In one case it was thought that although competitiveness may not improve if employing graduates with a good knowledge of sustainability the reputation of the company would improve due to the improvement in achieving their mission on conservation.

- “...improve our effectiveness... and improve our reputation.”

Others stated that it would improve investment or funding in the company from 3rd parties and ethical investors. In one case;

- “...ability to understand and win the argument re. climate change”

would help to spread their technology, and, as one respondent stated, the teaching of SD;

- “...should lead to long term gains in achieving a better quality of life for everyone now and for future generations. Naturally this will also result in cost savings in the long term”

5) Do you undertake any in-house training to raise awareness of sustainable development issues within your employees?

Six of the respondents suggested that training was undertaken. Some of the companies had SD training as part of their induction programmes for new graduate employees where SD issues relating to the company could be explained, discussed and taught. Others had internal training courses or talks specifically about SD, or SD was incorporated into relevant courses or talks. This was done to increase awareness, promote issues or teach specific aspects of SD. In some both environmental and social aspects of SD were included in training.

6) In relation to sustainability in the future, do you think there are specific skills / knowledge which graduates will need?

All respondents felt specific skills would be needed. A variety of both company specific and general topics were seen as needing further development. Examples of general topics included an understanding of current SD issues and more specifically those that would affect the company or organisation itself. Knowledge of regional, national and international sustainability issues and targets was seen as important.

- “Conservation issues – national and international levels”
- “Good level of theoretical and more practical scientific expertise which can be applied in environmental matters”
- “... awareness of global/national and regional sustainability initiatives and targets.”

Issues more specific to the company or organisation were also detailed; knowledge and competence in the use of sustainability audits, specific conservation issues, awareness of the factors that affect climate change, environmental impact assessment and recycling needs specific to the company.

Summary of the questionnaires

Bioscience Representatives

This dialogue is based on surveys of Bioscience Representatives (N=33) and graduate employers (N=7). 73% of the Bioscience Representatives appeared to have a reasonable understanding of the term “sustainable development” and 82% thought that it was “very important” or “quite important” for young people to have an understanding of sustainable development. However opinions were divided in respect to teaching SD. For some it was an embedded part of the curriculum and couldn't *not* be taught, for others it was seen as totally irrelevant to their subject and therefore would not be taught. Some felt it was not clear what the relevance of sustainable development was to basic biological sciences such as physiology or pharmacology or professional studies such as pharmacy or medicine.

Many of the respondents knew of SD issues already taught in their department and these issues covered a wide range of topics. Over half of the respondents felt that they and their colleagues had the knowledge and skills to teach SD. Yet one of the biggest barriers to implementing teaching or increasing teaching of SD was seen to be staff knowledge of SD issues. Training or resources for staff were suggested as a way of increasing teaching. Few of the respondents used specific SD learning resources, of those that did most used journals, research and web-based resources from organisations such as WHO and DEFRA. A wide variety of other departments within respondents universities were known to be teaching SD and over half of respondents said that they would consider, or are at present, using staff from other departments to teach SD to bioscience students. In replies to many questions lack of time, an already full curriculum and budget constraints were seen as problems to introducing or increasing the teaching of SD.

Employers

Six of the employers surveyed said that their company had an SD or environmental policy. The areas covered by these policies were wide ranging with both general and company specific aspects of sustainability covered. Half of respondents considered it 'Very Important' for graduate employees to have a broad understanding of the concept of SD and thought that graduates with knowledge of sustainability would improve their competitiveness. Six gave in-house training to graduates about sustainability, often directly related to the company. All respondents thought that, in relation to sustainability in the future, there would be specific skills/knowledge that graduates would need, with general issues of sustainability seen as important areas that required further development.

Implications for the Centre for Bioscience

The results of this survey will contribute to the Centre's strategic and operational planning. With response rates of 22% of Bioscience Representatives and 7 employer responses we acknowledge that the surveys can only provide the views of a small sample from both communities. Within the bioscience learning and teaching community, levels of awareness of and integration of ESD into the curricula, perceptions of the importance of ESD, issues pertinent to the biosciences and identification of support for staff have been highlighted. Responses from the employers have clearly indicated that whilst the level of sustainability awareness and training are currently variable all agree that sustainability is an area in which their future graduate employees will require knowledge and skills. It will be important that these views, despite coming from a small sample, are made available to the academic community to ensure that the formers' views are shared with and noted by the latter.

The two benchmark statements for the Biosciences and Agriculture, forestry, agricultural sciences, food sciences & consumer sciences both refer to sustainability within the curriculum. Whilst the Biosciences benchmark specifically refers to sustainability on a single occasion there is a further reference to the related philosophical and ethical issues. The Agriculture, forestry, agricultural sciences, food sciences and consumer sciences benchmark statement makes 28 references to sustainability in a variety of different sub-discipline academic contextsⁱ.

The Bioscience Representatives' survey demonstrates some fairly polarised views on the importance of sustainable development. Whilst the majority (88%) agree that HEIs have a role in helping to educate society about developing sustainability there was a much more even split between those who thought sustainable development should be a compulsory part of bioscience courses (49%) and those who disagreed with this or were undecided (51%). From the responses received (33) there were some clear disciplinary differences with the environmental and related academics responded in favour of developing and integrating sustainable development more than other bioscience disciplines (eg. biomedical sub-disciplines). There are clearly pockets of resistance and perhaps a differential awareness of what falls under the sustainability heading within and across certain disciplines. It is this that leads the Centre to consider developing a divergent strategy with regard to sustainable development taking a more subject-based approach for the disciplines within which sustainability would naturally fall and a more generic-based approach for those disciplines which do not perceive the issue as important. We also intend to invite further comment and feedback from the bioscience community in order to shape further our planning.

There are clear advantages in developing our work in conjunction with other Higher Education Academy Subject Centres, particularly GEES where there are clear overlaps in the ecological-related subject areas. The Centre has also worked with Philosophical and Religious Studies on ethics and it is clear that a number of bioscience sustainability areas are tied into the area of ethics. The Subject Centre for Physical Sciences may also be another potential collaborator. The Centre for Bioscience is supported by a number of Learned Societies who are developing their own work in this area, and others who have plans to do so. Amongst these are the Biosciences Federation, an umbrella organisation of a number of bioscience Learned Societies, and the Society for Experimental Biology.

In conclusion the Centre will consider what other information it requires now and in the future in order to decide how it will develop sustainability within the bioscience community. Whilst the government and the funding bodies clearly see sustainability as a priority the Centre is cognizant of different views amongst bioscientists. The Centre must first consider how much priority to assign to developing sustainability as a Centre activity, and how this will be delivered to the various and very different parts of our community. If we are to run a divergent strategy this will have implications in terms of staff time and finance. This decision will be taken in the context of the competing demands on the Centre and the availability of funding for this work.

Recommendations

The Centre for Bioscience will:

- consider how to develop sustainability within the bioscience community, with regard to subject disciplines, prioritisation and resource
- continue to raise awareness of sustainability as a government and UK funding body priority
- develop a better understanding by academics of what sustainability means in terms of their discipline and encompassing wider generic issues
- identify and share sustainability good practice
- identify and share sustainability learning and teaching resources
- continue to collect feedback from the bioscience academic community and bioscience graduate employers
- investigate opportunities for collaboration with other Subject Centres and Learned Societies

ⁱ Excerpts from Biosciences and Agriculture, forestry, agricultural sciences, food sciences and consumer sciences Benchmark statements:

a. Academic standards – Biosciences

1 Introduction

.....1.4 Biology has become a topical and important subject relevant to everyone - cloning, genetically modified organisms, the human genome project, the influence of mankind on the environment, the potential risks of some foods, and many other such topics appear in the media regularly. The biosciences have much to contribute to the health and wealth of the nation. Fundamental understanding of diseases, for example the role of micro organisms, together with the development of new vaccines, drugs and antibiotics, has saved many lives. But new developments that most biologists view as progress may alarm other people and the influence of the human species on the natural world has not been without costs. In recent times human activity has disturbed the environment to an unprecedented extent. We have reached a point in the earth's history where a knowledge of biology is essential for a viable human future. It is therefore important for leaders of society whether in government, industry, business or education to appreciate this and for an informed electorate to understand the scope and limitations of biological knowledge and techniques. Only then can we face the challenging social, ethical and legal problems posed by new developments such as stem cell cloning, gene patenting and gene therapy while working to maintain biodiversity and a stable and sustainable environment.

3 Knowledge, understanding and skills in the biosciences

3.2 Subject knowledge

Approaches to study and forms of subject knowledge likely to be common to all biosciences degree programmes will include the following:

.....

-engagement with some of the current developments in the biosciences and their applications, and the philosophical and ethical issues involved. Awareness of the contribution of biosciences to debate and controversies, and how this knowledge and understanding forms the basis for informed concern about the quality and sustainability of life;

Honours degree benchmark statement – Biosciences, QAA website

<http://www.qaa.ac.uk/academicinfrastructure/benchmark/honours/biosciences.pdf> (accessed 3 May 2005)

b. Academic standards - Agriculture, forestry, agricultural sciences, food sciences and consumer sciences

1 Introduction

.....Programmes broadly concerned with land-based industries

Agriculture and horticultureThe subjects apply fundamental physical, biological, economic and sociological principles to sustainable production in the countryside and consider the social and environmental impacts of such management systems.

Programmes broadly concerned with rural studies and sciences

2.11 Degree programmes in forestry are designed to develop the knowledge and skills of those who are involved in forest-related undertakings. They will be able to apply such principles and processes to the sustainable management of trees and forests for multiple benefits

Table 2: Subject-specific knowledge and understanding in honours degrees in agriculture, forestry, agricultural science, food sciences and consumer sciences/studies

Graduates will be able to assist in the application and communication of knowledge of food to meet the needs of society, industry and the consumer for sustainable food quality, safety and security of supply.

Honours degree benchmark statement – Agriculture, forestry, agricultural sciences, food sciences and consumer sciences, QAA website

<http://www.qaa.ac.uk/academicinfrastructure/benchmark/honours/agriculture.pdf> (accessed 3 May 2005)



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Sustainability Questionnaire

The Centre for Bioscience (formerly LTSN Bioscience) is participating in a Higher Education Academy project evaluating the current status of Education for Sustainable Development (ESD) in undergraduate degree curricula. We are contacting our Bioscience Representatives (formerly Departmental Contacts) to compile a response which will inform and establish a strong basis for our future work on behalf of the bioscience community.

To help us achieve our aims we would ask that you complete this questionnaire on behalf of your department or school. Only brief comments are needed.

All answers will remain completely anonymous and a copy of the report will be made available following its submission to the Higher Education Academy in May.

What are ESD and SD?

Education for sustainable development (ESD) has been defined by UNESCO to be: "a vision of education that seeks to balance human and economic well-being with cultural traditions and respect for the earth's natural resources".

Brundtland (1987) (Brundtland report - "Our common future", a UN commission report) defines sustainable development (SD) as: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

In terms of SD in Higher Education (HE) we understand this to mean "development of curricula and pedagogy to equip students with the skills and knowledge to live and work sustainably. This recognises the importance of sustainability literacy among students and the growing demand for sustainability skills among employers".

Questions require one of the following:

- *a comment*
- *an answer on a scale of 1 to 5*
- *a yes / no answer*

Questions marked with * are required fields

Your details	
Name *	<input type="text"/>
E-mail address *	<input type="text"/>
Department / School / Unit	<input type="text"/>
Institution	<input type="text"/>
Section 1 - General questions about sustainability	
a) Please comment on your understanding of what the term SD means.	<input type="text"/>
b) How important do you think it is for young people to have some understanding of SD?	<input type="text" value="1- not important"/>
c) Do you think HE should play a role in helping society to develop sustainability?	<input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> don't know
d) How do you think HE can contribute to a greater understanding of SD?	<input type="text"/>
e) How could your department or school contribute to a greater understanding of SD?	<input type="text"/>
2. Review of current practice in ESD in your discipline	
a) Does your institution have a strategy for SD?	<input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> don't know
b) Do you think the teaching of SD is relevant to your discipline?	<input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> don't know
c) Do you think that SD should be a compulsory part	<input type="text" value="1- definitely not"/>

of bioscience programmes?	
i) Please comment on your above answer	
d) Are issues of SD already incorporated within your bioscience degree(s)?	<input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> don't know
i) If yes, how is SD incorporated (i.e. integrated within modules or a specific SD module)?	
ii) If yes, which areas of SD are incorporated?	
iii) If no, which SD issues do you think should be incorporated?	
e) Do you think you and your colleagues have the knowledge and skills to teach issues related to sustainability?	<input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> don't know
i) What training / support would you and your colleagues require in order to teach or increase teaching of SD?	
f) Do you or your colleagues use any specific learning resources linked to the teaching of SD in the curriculum?	<input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> don't know
i) If you do use specific learning resources, please provide details.	
3. Identification of ESD in other disciplines	
a) To your knowledge do any other departments or schools	<input type="checkbox"/> yes

within your institution teach SD?	<input type="checkbox"/> no <input type="checkbox"/> don't know
i) If yes, which?	<input type="text"/>
b) Would you consider using staff from other departments to teach SD to bioscience students?	<input type="text"/>

End of Questions - Thank you for your time

Appendix 2: On-line questionnaire - Employers

Education for Sustainable Development

What are ESD and SD?

Education for sustainable development (ESD) has been defined by UNESCO to be: "a vision of education that seeks to balance human and economic well-being with cultural traditions and respect for the earth's natural resources".

Brundtland (1987) (Brundtland report - "Our common future", a UN commission report) defines sustainable development (SD) as: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

www.aren.admin.ch/imperia/md/content/are/nachhaltigeentwicklung/brundtland_bericht.pdf

The UK Government has recently published its Sustainable Development Strategy "securing the future" in which education plays a key role. We understand SD in Higher Education (HE) to mean "development of curricula and pedagogy to equip students with the skills and knowledge to live and work sustainably. This recognises the importance of sustainability literacy among students and the growing demand for sustainability skills among employers".

Questionnaire

Questions require one of the following answers:

- a comment (the boxes will expand as you type)
- an answer on a scale of 1 to 5
- a yes / no answer

NB. By "Bioscience graduates" we mean graduates with a first degree, e.g. BSc, and not those with a postgraduate degree.

Personal details

Name	
E-mail	
Organisation	
Role in organisation	

1. Does your organisation or company have a policy position or statement relating to sustainable development?

- a. Yes / No (*Please delete as applicable*)
- b. If yes, what are the four main themes of the document (i.e. recycling, ethical issues, employment rights etc)

2. How important do you think it is that any graduates you recruit have a broad understanding of the concept of sustainable development? (*Please delete as applicable*)

- 1 – Not Important
- 2 – Of little importance
- 3 – Fairly important
- 4 – Quite important
- 5 – Very important

3. Please suggest 3 areas of SD that would be particularly useful for graduates joining your organisation to have a good knowledge of.

4. Do you believe that employing graduates with a good understanding of sustainable development will enhance your efficiency or marketplace competitiveness?

- a. Yes / No (*Please delete as applicable*)
- b. If yes, please give provide one example of how competitiveness could be improved

5. Do you undertake any in-house training to raise awareness of sustainable development issues within your employees?

- a. Yes / No (*Please delete as applicable*)
- b. If yes, please give one example of the type of training undertaken

6. In relation to sustainability in the future, do you think there are specific skills/knowledge which graduates will need?

- a. Yes/No (*Please delete as applicable*)
- b. If yes, please state two areas that require further development

End of questions, thank you for your time.

Appendix 3: Sustainable Development Learning Resources

World Health Organisation (WHO) - www.who.int/en/

The WHO (the Health division of the United Nations) website has a wide range of data and also case studies highlighting, for example, the rebuilding of Sri Lanka after the tsunami. The WHO website also provides data such as mortality rates, disease statistics, and public health statistics and access to WHO reports and publications.

Tearfund - www.tearfund.org/

Tearfund is a Christian aid agency. Its website contains a 'learning zone' with access to a wide range of publications from Tearfund including reports on the responses of governments to climate change disasters and information on topics such as child development.

UK indicators are provided by a number of organisations, for example the Environment Agency (www.environment-agency.gov.uk/yourenv/432430/) and the Forestry commission (www.forestry.gov.uk/forestry/infid-4xhdbf). They can indicate the overall state of the environment and can detail, for example, energy consumption, CO₂ emissions and household water usage.

Scottish National Heritage (SNH) - www.snh.org.uk/

SNH aims to "secure the conservation and enhancement of Scotland's unique and precious natural heritage - the wildlife, the habitats and the landscapes which have evolved in Scotland through the long partnership between people and nature". Its website contains its annual report, facts and figures about the environment in various areas of Scotland and details of SNH's work.

Scottish Executive Environment Rural Affairs Department (SEERAD) – www.scotland.gov.uk/About/Departments/ERAD

The SEERAD website provides information on policy and legislation and also news stories related to agriculture and the environment in Scotland.

Scottish Environment Protection Agency (SEPA) - www.sepa.org.uk/

The SEPA website offers environmental reports, for example "Radioactivity in food and the environment" and data, such as water quality and emissions release in Scotland. New reports and environmental guidelines are also available to view and download

Food and Agriculture Organisation (FAO) - www.fao.org/

The FAO website contains a range of documents and statistics relating directly to sustainable development, including bio-energy and sustainable livelihoods. Also available are statistics, news stories and reports related to agriculture, forestry and fishing etc that would be of use when focussing on ESD.

Department for the Environment, Food and Rural Affairs (DEFRA) - www.defra.gov.uk/

The DEFRA website contains departmental and ministerial statements, summaries of topical issues such as recycling, DEFRA publications (for example "Action plan to develop organic food and farming in England" and "Climate change and agriculture in the UK") and some data, for example bird populations.

Eco-Management and Audit Scheme (EMAS) - europa.eu.int/comm/environment/emas/index_en.htm

EMAS was launched in April 1995 and is the EU voluntary scheme for organisations "willing to commit themselves to evaluate, improve and report on their environmental performance". The site contains a wide range of resources including: Legislative texts, guidance documents, leaflets, fact-sheets, brochures, training material and case studies.



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