Copies of publications in chronological order

(most recent first)
A Quick Guide to Education for Sustainability

“What if education systems prepared learners to enter the workforce as well as handle a crisis, be resilient, become responsible citizens, adapt to change, recognize and solve local problems with global roots, meet other cultures with respect, and create a peaceful and sustainable society? Then we would be educating for a more sustainable future.”

(UNESCO)

What on earth is it all about?
Sustainable development is the process that enables humanity to move towards an environmentally, socially, economically and culturally sustainable world. Education for Sustainable Development (ESD), also known as Education for Sustainability (EFS), is an umbrella term for many forms of education that already exist and is integrated with the concept of Global Citizenship. It promotes a rethink of educational programmes and systems (both content and methods) that currently support unsustainable societies. The United Nations’ Decade of Education for Sustainable Development (2005-2015) has set out to coordinate and stimulate initiatives around the world. In the UK, HEFCE and the HEA are acknowledging the importance of EFS and are committed to supporting its development through grants and coordinating initiatives.

Why at the University of Exeter?
The Government’s Chief Scientific Advisor Prof Sir John Beddington has raised the prospect of a “Perfect Storm” of global dimensions by 2030, with the impacts of global challenges such as climate change, food, energy and water security coming together to significantly impact on the lives of all people on earth. This prospect invites a response from researchers and educators alike to find solutions for a more sustainable society. A research-intensive university, Exeter is committed to sustainability. It has invested in important research themes such as Climate Change and Sustainable Futures and the Environment and Sustainability Institute in Cornwall. This world leading research is mirrored in a growing suite of sustainability programmes and modules, including the One Planet MBA and introductory modules such as Global Futures and Geographies of Environment and Sustainability.

What does it mean in the context of a discipline?
Sustainability has relevance to nearly every discipline, whether it is accounting (environmental audits), mathematics (climate modelling) or psychology (understanding behaviours). However, whether your teaching has direct relevance to sustainability or not, students will look to you for encouragement to act as a responsible citizen. This encompasses culturally inclusive behaviour as well as environmentally sound practices. Research has found that lecturers have a strong influence on students in generating a positive interest in sustainability issues as well practical behaviours such as energy preservation. However, if no references are made to sustainability, it is understood by students as a discouragement.

What are the underpinning values?
The values for sustainability are founded in social and economic justice, environmental responsibility and positive dispositions towards cultural diversity. The Earth Charter, a declaration of fundamental ethical principles for building a just, sustainable and peaceful global society in the 21st century, sums up the motivation for EFS:

We stand at a critical moment in Earth’s history, a time when humanity must choose its future. As the world becomes increasingly interdependent and fragile, the future at once holds great peril and great promise. To move forward we must recognize that in the midst of a magnificent diversity of cultures and life forms we are one human family and one Earth community with a common destiny. We must join together to bring forth a sustainable global society founded on respect for nature, universal human rights, economic justice, and a culture of peace. (Preamble Earth Charter)
How much does a student need to know about sustainability?

The University is seeking to equip all students with a basic level of sustainability literacy. Just as employers expect graduates to have a basic level of IT literacy, similarly they prefer graduates who have an understanding of sustainability issues and behaviours. Driven by legislation as well as ethics, businesses and non-profit organisations alike need to respond to carbon, energy, water and waste issues.

In addition to this basic level of knowledge and understanding, students who aspire to become specialists can study sustainability in more depth through sustainability pathways, elective modules and postgraduate programmes. Students have the opportunity to become specialists in a narrow discipline, for example in Renewable Energy or Ecology. They can also specialise in broader sustainable development programmes such as the MSc Sustainable Development or the One Planet MBA.

What does this mean for the way we teach?

Putting the future of the student at the centre, EIS is based on respect for the learner and the learner’s journey. Going further than the transfer of knowledge, it challenges the learner’s pre-conceptions about global issues and encourages the exploration of values systems and attitudes. The following teaching approaches are associated with EIS:

Action learning:
An educational process whereby the participant studies their own actions and experience in order to improve performance. Learners acquire knowledge through practice-based activities, rather than through traditional instruction.

Experiential learning:
To acquire and apply knowledge, skills and relate to feelings in an immediate and relevant setting or learning that is achieved through reflection upon everyday experience. Here learning is not sponsored by some formal educational institution but by people themselves.

Transformational Learning:
Learning that takes learners’ knowledge and skills into a different domain and leads to questioning of accepted assumptions and views and to new ways of knowing, understanding and acting.

Research inspired learning / Problem based learning:
A student-centered pedagogy in which students learn about a subject in the context of complex, multifaceted and realistic problems. Working in groups, students identify what they already know, what they need to know, and how and where to access new information that may lead to resolution of the problem. The role of the instructor shifts to become that of a facilitator of learning.

Advice and help

Internal
Harriet Sjørps-Jones (Curriculum)
H.Sjørps-Jones@exeter.ac.uk
Karen Gallagher (Campus & Operations)
K.M.Gallagher@exeter.ac.uk

External
Communities of Practice:
- Green ICT, (USC)
- Sustainable labs (HEEPI)
- Sustainability in Higher Education Developers (SHED)
- Environmental Association of Universities and Colleges (EAUC)

For free membership contact Karen Gallagher

Further reading
‘Earth in Mind’ by David Orr
‘Sustainability Education’ by Jones, Selby and Sterling
‘The Sustainability Curriculum: The Challenge for Higher Education’ by Blewitt and Cuttingford

Free HEA resources:
Handbook of Sustainability Literacy

Humanities
- Cultural diversity
- Cultural Ecology
- Identity & place
- Displacement
- Ecopolitics
- Eco literature
- Eco-literate
- Emerging Language of Global and Environmental Change
- Environment and Identity
- Ethical behaviour
- Past Environments
- Nature writing
- Non-violent communication
- Sustainable Futures
- Sustainability Literacy
- Systems Thinking

Life & Environmental Sciences
- Climate Change
- Biodiversity
- Ecosystem Services
- Pollution
- Biodiversity
- Protection from carbon capture
- Desertification
- Genetic Modification
- Migration
- Animal
- Toxicology
- Geography
- Agenda 21
- Carbon Footprint
- Carbon Reduction Targets
- Carbon Capture
- Carbon Cycle
- Climate Change Refugees
- Climate Change Mitigation
- Desertification / Deforestation
- Energy policy
- Environmental auditing
- Environmental Management Systems
- Energy security
- Future proofing
- Gaia Theory
- Global Village
- Greenhouse gas
- Millennium Development Goals
- NIMBY / Public Engagement
- Rising Sea levels
- Risk Assessment
- Soil erosion
- Transition Movement
- Urbanisation
- Psychology
- Behavioural change
- Sport & Health Sciences
- Blue Gym / Green Gym

Social Sciences and International Studies
- Conflict resolution
- Development Education
- Earth Charter
- Eco-Jam / Green Gym
- Ecocide
- Energy Security
- Environment and citizenship
- Environmental Compliance
- Environmental Reasoning
- Environmental policy
- Ethics
- EU Environmental Legislation
- Food Security / Water Security
- Global Citizenship Education
- Human Rights
- International Dialogue
- International Law and Treaties
- Peace Studies

*Sjørps-Jones, 2005
Enabling the future we want: 
Education for Sustainable Development in the UK
Enabling The Future We Want: Education for Sustainable Development in the UK

A Manifesto for dialogue, collaboration and action Post Rio+20

Facilitated by eauc

Implementing RIO+20 United Nations Conference on Sustainable Development

December 2013
Preface

The intergovernmental agreements coming out of Rio +20 ('The Future We Want') included commitments to quality education, to improve quality of life, to Education for Sustainable Development (ESD) and to embark on a process toward Sustainable Development Goals. One year on it appears that the Post 2015 Development Agenda is expected to incorporate Sustainable Development Goals (SDGs) as the successor to the Millennium Development Goals (MDGs). How this unified Global Development programme, aimed at poverty alleviation in the context of sustainable development is realised, is yet to be decided, but timings are crucial and the role of education is recognised as being pivotal. Principles like universality, listening to outcomes of stakeholder participation, a foundation in human rights and the need for prioritisation at the national level are emerging. This consultation into the future of education for sustainability and the manifesto both act on our UK Rio+20 commitments and takes account of the global context.

This manifesto calls on governments, education sectors, NGOs and civil society in the United Kingdom to work closely together to strengthen the role of education as an enabler of Sustainable Development.

This document is the result of a UK-wide consultation with NGOs, Government funded agencies, Government Departments, politicians and formal and informal education sectors. The consultation took place from November 2012 to May 2013 in response to the Rio+20 outcome document 'The Future We Want'.

'The Future We Want' has very strong educational commitments including explicit objectives such as engaging more learners in Education for Sustainable Development (ESD) and improving educational quality, as well as implicit commitments around education's role in moving society toward more sustainable development. Most specifically the outcomes in Paragraphs 229-235 focus on the tools for education: research, innovation, participation, international co-operation, curriculum change and youth engagement.

Rio+20 clarified that Education for Sustainable Development (ESD) is key to achieving both a Green and Fair Society and the Sustainable Development Goals (SDG), as well as being a key component of a quality education.
The Manifesto

Supporting mechanisms that governments and civil society should put in place to enable and strengthen UK delivery of the educational commitments agreed in The Future We Want.

Governmental responsibilities

The UK government and the devolved governments of Northern Ireland, Scotland and Wales have a responsibility to articulate and support the important role that education plays in achieving poverty eradication in the context of sustainable development, and in meeting the United Kingdom’s targets for the reduction of greenhouse gasses. We acknowledge that some parts of the UK have made more progress than others in advancing policy for ESD.

We are calling for:

1. Better coordination of efforts and collaboration between governments and across government departments on formal and informal learning for sustainable development.

   Recommended actions
   - The Environmental Audit Committee to regularly put ESD related issues on its agenda and facilitate dialogue
   - UK government departments (BIS, DEFRA, DECC, DFT, DoE, and DfID) and devolved government agencies to identify how they will support ESD in formal and informal learning settings to meet their own targets for SD

2. Improvement of dialogue between the education sector, civil society and government departments

   Recommended actions
   - Offer incentives and opportunities for collaboration and partnership building across education sectors, business, and environmental, developmental, educational and faith-based NGOs
   - Funding to focus on the long term
   - Ensure youth and student voices play an active role in this dialogue

3. Enabling education sectors to develop an appropriate curriculum to meet current and future sustainability challenges through a realignment of funding with The Future We Want in mind

   Recommended actions
   - Inclusion of ESD in education ministers’ portfolios
   - Endorsement and support for those institutions and organisations that lead the way with good practice

December 2013
Formal learning (Education and Training sectors)

The formal education sector recognises that it has a critical role in sustainable development as it has a moral responsibility to prepare young people for the future and equip them with the skills, attributes and knowledge needed to contribute to sustainable development as citizens and future professionals. It also recognises that it needs to provide opportunities for up-skilling the workforce to advance the Green and Fair Economy and community learning for innovation and resilience.

We are calling for:

4. Curriculum change

Recommended actions
- Teacher Training to include training in ESD
- Education quality and enhancement bodies to provide incentives for ESD
- Include learning about sustainability issues and solutions in national curricula objectives
- Immediate implementation of the commitment in the Natural Environment White Paper that includes the aspiration that 'we want to see every child in England given the chance to experience and learn about the natural environment'
- Involvement of students in curriculum design
- Encouragement of interdisciplinary learning opportunities

5. Institutional change

Recommended actions
- Education institutions to provide leadership in SD and act as beacons of good practice in society
- Education institutions to work closely with local communities
- Education institutions to provide support for those young people not engaged in formal further education

Informal learning

Learning also takes place in communities and at home. Faith groups, charities and community networks play an important role in life-long learning, citizenship, up-skilling volunteers, resilience building and developmental work.

We are calling for:

6. Increased collaboration between NGOs and formal education providers

Recommended actions
- Environmental, developmental, educational and faith-based NGOs to collaborate more on this agenda (with each other, and the formal education sector)
- NGOs to collaborate with Higher Education Institutions (HEIs) to keep informed of latest research in SD and work together on solutions

December 2013
Emphasise the connection between ESD and the economy

Both the need for a thriving Green and Fair Economy, and the reassessment of the effectiveness of GDP as a global tool to measure progress, moving towards a GDP+ framework, highlight the need for ESD.

We are calling for:

7. Increased collaboration between governments, NGOs, business and education sectors to ensure young people are sufficiently prepared for the opportunities and challenges of a Green and Fair Economy

Recommended actions
- Professional, statutory and regulatory bodies to continue to recognise the importance of sustainability in their guidelines
- Business Schools to take an active role in the realignment of the economy with planetary boundaries and poverty eradication

Footnotes
1 Over 50 organisations have been engaged in dialogue in response to a stimulus paper (The UK Future of Education for Sustainable Development – night responsibilities for education) around educational priorities within ‘The Future We Want’. They include: Association of Colleges, Black Environment, CADISPA Network, Chris Cowburn (HEFCW), Copernicus Alliance of Universities for Sustainability, Department for Education, Department of Food and Rural Affairs, Earth Charter UK, Education Dialogue Group, Environmental Association for Universities and Colleges, Environmental Audit Committee, Eradicating Ecocide, Global Responsible Leadership Initiative, Green Party, Higher Education Academy, Learning and Skills Improvement Service, London South Bank University, National Union of Students, Natural History Museum, OFSTED, Policy Studies Institute, SGU-UK, South West Learning for Sustainability Coalition, Sustainability and Environmental Education, Transition Network, Universities UK, University & College Union, University of Westminster.

2 The Future We Want
229. We reaffirm our commitments to the right to education and in this regard, we commit to strengthen international cooperation to achieve universal access to primary education, particularly for developing countries. We further reaffirm that full access to quality education at all levels is an essential condition for achieving sustainable development, poverty eradication, gender equality and women’s empowerment as well as human development, for the attainment of the internationally agreed development goals including the Millennium Development Goals, as well as for the full participation of both women and men, in particular young people. In this regard, we stress the need for ensuring equal access to education for persons with disabilities, indigenous peoples, local communities, ethnic minorities and people living in rural areas.
230. We recognize that the younger generations are the custodians of the future, as well as the need for better quality and access to education beyond the primary level. We therefore resolve to improve the capacity of our education systems to prepare people to pursue sustainable development, including through enhanced teacher training, the development of curricula around sustainability, the development of training programmes that prepare students for careers in fields related to sustainability, and more effective use of information and communication technologies to enhance learning outcomes. We call for enhanced cooperation among schools, communities and authorities in efforts to promote access to quality education at all levels.
231. We encourage Member States to promote Sustainable Development awareness among Youth, inter alia, by promoting programmes for non-formal education in accordance with the Goals of the United Nations Decade of Education for Sustainable Development.
232. We emphasise the importance of greater international cooperation to improve access to Education including through building and strengthening education infrastructure, increasing investment in education particularly investment to improve the quality of education for all in Developing countries. We encourage international educational exchanges and partnerships, including the creation of fellowships and scholarships to help achieve global education goals.
233. We resolve to promote Education for Sustainable Development and to integrate Sustainable development more actively into education beyond the United Nations Decade of Education for Sustainable Development (2005-2014).
234. We strongly encourage educational institutions to consider adopting good practices in sustainability management on their campuses and in their communities with the active participation of inter alia students, teachers, and local partners, and teaching sustainable development as an integrated component across disciplines.
235. We underscore the importance of supporting educational institutions, especially higher educational institutions in developing countries, to carry out research and innovation for sustainable development, including in the field of education, to develop quality and innovative programmes, including entrepreneurship and business skills training, professional, technical, vocational training and lifelong learning, geared to bridging skills gaps for advancing national sustainability.
4 Education for Sustainable Development (ESD) in the UK – Current status, best practice and opportunities for the future, March 2013, United Kingdom National Commission for UNESCO.
Contact: Consultation Secretariat, Environmental Association for Universities and Colleges (EAUC), University of Gloucestershire, Park Campus, Cheltenham, GL50 2RH, info@eauc.org.uk, www.eauc.org.uk
The Future We Want: A Global Expert Discussion on the Future of Rio+20
Efforts on Higher Education
The Future We Want: A Global Expert Discussion on the Future of Rio+20 Efforts on Higher Education

The 2012 United Nations Conference on Sustainable Development, Rio+20, was the largest UN event ever held. It saw more than $513 billion in voluntary commitments for sustainable development—from governments, business, and universities, among other groups—and produced an outcomes document entitled The Future We Want. While not considered a success by many standards, the document includes important content and context for higher education around the world. This roundtable features higher education representatives who were instrumental in shaping the document and what they see for the future of sustainable development from an education perspective.

Paul Rowland: What was the highlight of your participation in Rio+20?

Clemens Mader: The highlight for me was when I saw the youth celebrating when nonformal education was included in the final document, The Future We Want. Nonformal education seemed to be skipped from the final document, and then the young people came in and negotiated with the delegates and told them how important it is to have it in. So nonformal education was brought into the final outcomes document and when it was publicly announced, the youths were really celebrating and giving emotion to this whole dry process of negotiations, and that was very great to see. They had loads of spirit.

Aurore Klepper: I was not physically there, but for us and also for the other French institutions in higher education, it was great to exchange ideas with foreign partners who work on the same issues that we do. On that point, it was really good and was what we were looking for—to begin this conversation with others and to discuss sustainable development in higher education. It was also great to see how higher education was represented at Rio in the final document. One of our goals, indeed, is to leverage the role of higher education in sustainable development within the territories. That is what the foundation is trying to do: gather public and private partners on innovative and sustainable projects, such as universities and their stakeholders.

Harriet Sjærps-Jones: My highlights from Rio+20 were to experience the power of distributed leadership and grassroots movements. That was very evident in Rio. And this was happening through mobile technologies and the Internet. The organization of our side event, The Role of Tertiary Education in Sustainable Development, was an example of this and how we were able to prepare for this meeting and organize the meeting while we had never been in Rio before. Also, one of the highlights for me was, while The Future We Want document is disappointing in many areas, it was better than we expected in the field of education, and that is really encouraging.

Kim Smith: I had the fortunate opportunity to go to Rio and work with an incredible collaboration of international folks who really gave me such a sense of passion and encouragement for the changes that are possible. I was able to see what is happening around the world and learn about the efforts in higher education. It was really exciting to see the paragraphs added into The Future We Want document and have higher education receive greater recognition. There really was a lot of enthusiasm, and people are stepping up and saying that higher education is going to have a very core role to play in implementing The Future We Want.

Leanne Denby: For me, apart from actually being at such a momentous occasion, the highlight from Rio+20 was the opportunity to meet and network with other like-minded people from associations similar to Australasian Campuses Towards Sustainability (ACTS). It was an opportunity to meet other people, to see how the United Nations process worked, and then try and understand what it means to take the role of higher education forward.

JC Carteron: I was the representative of French higher education and signatories of the Tertiary Education Collaboration for Sustainability society, and our main contribution was to be deeply involved in the higher education sustainability initiative, which was actually a major declaration for higher education during Rio. This declaration represents more
than one third of the 700 voluntary commitments into the Rio process.

Daniella Tilbury: Rio+20 was an important summit for those engaged in higher education. For the first time, universities and colleges were acknowledged as important stakeholders and accredited as official participants of the UN Sustainable Development process. This may not seem like much, but for someone such as I, who has participated in all three summits, this is a significant achievement that will make it easier for this sector to have a voice in the future. It was in this context that the Rio+20 People’s Sustainability Treaty on Higher Education was launched. The Treaty, which now counts 94 signatures from agencies, organizations, and institutions from around the globe, called for higher education to innovate for sustainability and not just integrate sustainability into higher education. We need to rethink our systems, rethink our curriculum, rethink our efforts so that they have greater impact in the way we live and the way we work professionally and not just treat sustainability as a thematic that needs to be included in the curriculum.

Paul Rowland: Some have described the conference as a failure and others as a success. How would you characterize the event and its outcomes?

JC Carteron: On the one hand, governments have certainly missed an excellent opportunity to recognize sustainable development as a lever for positive change—not just a constraint during an economic crisis. I think that is the reason why people have said it was a failure. However, people from all parts of civil society were there. The fact that there were so many collaborations and new projects was really exciting. And the big winner from Rio is definitely higher education because for the first time education is really recognized as a key agent for change. We have six paragraphs in The Future We Want text fully dedicated to education. And if you just scan the word text, you have about 60 times where the words education, training, academia, and school are mentioned.

Leanne Denby: It is only a failure if we let it be a failure. The fact that there were 50,000 people there talking about how we create a future we want, is a positive sign. There were discussions. There were outcomes. Now all we need to do is galvanize those outcomes and actually start implementing them. Also, we ran a very successful side event. Despite the timing that we had and the change of rooms and all the last-minute things that occurred, the event was very well attended. I went to several other side events while I was there, and the passion of the civil society is unbounded. Just understanding that that passion exists and that need to take action is there, is, in itself, a success.

Kim Smith: I know a lot of people were disappointed in The Future We Want that they felt it was watered down. Certainly the battles over women’s health and which governments were willing to really engage and implement the practices, that was frustrating. I was frustrated, for example, hearing noncommittal speeches from delegates or heads of state, such as when Canada said, “You can come in and monitor our tar sands, but we do not want any international intervention.” I thought that was disheartening. But on the other side, it was a powerful movement of civil society. It was clear that that is where the energy is going to come from.

For our work in higher education, it was amazing to have all of us sitting together and having each country represented and hearing of the amazing things people are doing through our sister associations. What will prove that it was a success or not is the realization of what we are capable of implementing in the future. There is momentum there and we need to be able to move forward.

Harrist Sjers-Jones: I agree with Kim. It is now clear that directions or policies are not coming from governments. And, interestingly, even if governments have found agreement to a certain extent, such as in the Kyoto Protocol, recent carbon data shows that policy has had little impact on carbon emissions. They only show a temporary blip in 2009 that correlates with the economic downturn, only to be followed by the highest CO2 emissions on record. (For more on this, see TEDx talk at: http://www.youtube.com/watch?v=V6eAJxEx3sE.)

To me it is a confirmation that change is going to come from civil society. There was another example just recently. The Environmental Association for Universities and Colleges (EAUC) had organized a meeting with the new environment minister here in the United Kingdom and we got the same messages as we did in Rio—a hands-off approach. But the environment minister was very keen to learn from those people who sat around the table, and it was good to have a dialogue. It is a long process and change is going to come from the grassroots movement informing politicians, and politics are going to tell society what to do. So in a way it is good that it is clear. In past decades we have put too much hope on governments.

Clemens Mader: For sustainable development, there is a change to the governance process itself. Grassroots instead of governments cooperate for sustainable development. Governments set the framework; society takes actions. We also need to redefine global partnership in the sense that people that are locally active cooperate on a global level because they are so networked to each other, and I think that was clearly coming out in Rio.

Governments have certainly missed an excellent opportunity to recognize sustainable development as a lever for positive change

—JC Carteron

The fact that there were 50,000 people there talking about how we create a future we want, is a positive sign.

—Leanne Denby
Paul Rowland: One of the statements in The Future We Want (paragraph 234) is:

We strongly encourage educational institutions to consider adopting good practices and sustainability management on their campuses and in their communities with the active participation of inter alia students, teachers, and local partners and teaching sustainable development is an integrated component across the disciplines.

Are there going to be ways that you will be able to leverage that statement and the fact that your nations have signed off on this document in order to achieve any specific goals?

Leanne Denby: It is going to depend on the extent to which The Future We Want document is utilized. I am not just talking at an international level, or even a national level, but by sector. I think that will come down to platforms such as ACTS. The good thing is that what was mentioned in that paragraph is actually happening in a lot of instances across higher education. I cannot think of any institute in Australia that is not trying to do something that would address those specific actions requested. The whole idea of how to make a green campus—that is occurring. We can use that statement to galvanize the higher education sector. We can use it to galvanize the government to ensure that they support associations like ACTS and AASHE and others. It will be meaningless unless it is addressed and utilized in some way. But that is not to say that those actions are not already occurring.

JC Carteron: Let me use the example of France. We have three ways to use this text. The first one is to do some lobbying with the French government. And that is what we did just after Rio. We went to see the new government in France and said, “You signed this declaration and now we need to put it into practice.” And we had really good feedback from the government. The second thing is to use it as a platform to discuss between like-minded organizations, such as ACTS and AASHE. We can use this text as a base of a new working group with all of those people. It could be the common platform. The next step is to use every single part of this paragraph within the strategy of the school. At my school, we are really pushing sustainable development deeper in the core strategy, and not only as a niche market. These texts can be the backbone of our strategy now.

Harrist Sjöepe-Jonæs: This paragraph exemplifies why we set this recent meeting in London, to have that discussion. It is exactly around this. Now, the United Kingdom has endorsed The Future We Want document; we have asked the government what they are going to do about it, what actions they are going to take. It is a first step and now what needs to be done is universities must give really powerful examples because often it is not that people do not want to do it, they just do not know how, or they cannot imagine how it can be done. So it is working together to showcase these good examples and lead by example.

Kim Smith: Paul, I will defer to you. What do you think is happening in the United States and Canada?

Paul Rowland: Well, in the United States, and to some extent in Canada, there is not a lot of attention paid to United Nations documents. I think we are probably going to see that there as well. However, there is always the opportunity for organizations to use these documents for leveraging wherever you can. Is that true in Europe as well, being able to use these as leverage documents, as opposed to accepting them as policy?

Aurore Klepper: Well, in France, we already had some commitments for sustainable development in higher education. RIO+20 has reinforced this position so it is providing support for us. One of the roles of higher education in France is to show other stakeholders, like local authorities or firms, that they can play a key role in sustainable development, and encourage more integration and to work together. And Rio+20, even though my group could not be there, it helped us and our partners to have new contacts and really to work on specific initiatives. For example, to work together on the assessment of sustainable development on campuses because it is an issue we all have.

Clemens Mader: In Austria we are updating the sustainability strategy, which is now going to include the aspects of the Rio+20 outcomes document. It will be included in the national strategy in Austria on sustainable development.

From the European Union side, on October 25, 2012, there was a ministerial conference where all the environmental ministers came together. This conference was specifically reacting to the outcomes of Rio+20 and so in this outcome document of the ministerial conference of the European Union, they reflected the aspects of education that were included in Rio+20. They said that in Europe there needs to be a strengthening of educational capacities within the countries, so this was a clear statement from the EU side to the countries in Europe to strengthen educational institutions and capacities for sustainable development.

Kim Smith: Clemens, I appreciate you saying that. That was one of the things I thought was really great coming from Austria. You have a wonderful commitment from your government. Another good example came from Brazil and India, who both said that they committed to requiring sustainabl-
ity through their whole national curriculum. And Denmark really stood out as well as Japan, with each country standing up and saying, "This is a new way of doing our work and organizing our government." I was so inspired by those examples. We at least now have some guidelines documents created by shared efforts to synthesize these main goals into principles. Then we will be able to implement them on local levels and regional levels that can be customized to the needs of those areas.

Paul Rowland: A good deal of effort was put into Rio+20 by the higher education community. There was the input that went into the compilation document. There was the organizing of the side event. There was the assemblage and recruiting of people to sign on to the Higher Education Sustainability Initiative. There was work with the Peoples' Sustainability Treaties, the higher education groups within the Peoples' Treaties. Then of course, there was the monetary cost and greenhouse-gas emissions from traveling to the conference. All told, how would you assess the effectiveness of higher education's presence at Rio+20? Was there a payoff?

Leanne Denby: In a word: yes. It was worth all the effort. Even if we did not come out as successful as everyone would have liked, the fact that we have all of those paragraphs in the outcomes document, it was worth the effort. Unless you put in the effort, you are never going to get that presence. For me, it was worth all the anguish and all the time in trying to coordinate everybody to have a say and a presence and get higher education on the table. In general we were fairly successful in that.

Obviously, there is always more you can do and there are always more successes you can have. The fact that we now have discussion among so many higher education associations at an international level, that is worth it, regardless of what we would have gotten out of the outcomes document or the side event. So yes, I think it has definitely been effective and definitely worthwhile.

JC Carteron: If I can just follow Leanne, and say if you count the number of students who are behind the engaged schools or universities—they number in the millions!

Of course we can always say, "We could have done better," but I think we can see Rio not only as a picture but like a part of a film. Rio is the beginning of something.

Harriet Sipers-Jones: It is quite difficult to identify a direct payoff here. What this conference accomplished was to help us consider ways forward and find opportunities for dialogue with stakeholders and see where our strengths are and whom we should partner with. We are strengthening in the area and also, Prime Minister David Cameron is going to co-lead the international panel on the Sustainable Development Goals. We are going to focus our efforts on him and making sure that education is going to be addressed appropriately. It is an ongoing process.

Kim Smith: The side event was well attended and pretty well received. We tried to cover too much in that short amount of time, but the scale of the coordination to achieve it and the connections that were made—a lot of things have come out of that. There have been several networking and outreach opportunities. Also I have received many requests for the tertiary education handout that we used. That document summarized all of the core benefits that higher education offers to the implementation of the broader governmental goals that were set in The Future We Want. That was very effective.

Another example came from working with Elizabeth Thompson, the UN assistant secretary-general. She launched the Higher Education Sustainability Initiative. That launch was a really big event; there were people from all over the world stating that they were making commitments. I know it is something that does not appear to have a lot of implementation power, and is difficult to assess in real terms, but that was certainly something that got a great deal of exposure.

Clemens Mader: It is worth noting that the sciences were also heavily represented within Rio. This is mirrored in The Future We Want, where science research, science/society interaction are very much present within the document. It shows the need for scientists and higher education as a whole to work with society in the future. It mirrored the presence of higher education and science at Rio that then finally came into the document.

Paul Rowland: Let me jump back to the document itself. I am going to move from the paragraph that referenced sustainability management to the one that follows, paragraph 235. The text of the paragraph is:

We underscore the importance of supporting educational institutions, especially higher education institutions in developing countries, to carry out research and innovation for sustainable development, including in the field of education to develop quality and innovative programs, including entrepreneurship and business skills training. Professional, technical, vocational training and lifelong learning geared to bridging skills gaps for advancing national, sustainable development opportunities.

My question to you all is: What should higher education institutions be doing as a result of this kind of directive?

The science/society cooperation is where the innovations for sustainable development come from. And that requires new methodologies of doing research, of doing education. —Clemens Mader
Clemens Mader: The paragraph, even though it is concentrating on developing countries, the necessity of it can be seen globally. I just spoke about the science/society cooperation and this is where the innovations for sustainable development come from. And that requires new methodologies of doing research, of doing education. This paragraph affects higher education institutions globally.

Kim Smith: I think it demonstrates that we really need to step up with partnering with social entrepreneurs to make sure that we are training our youth and training our citizens to be able to effectively manage programs around meeting social needs.

JC Carteron: For example, all of my students have to stay at least six months abroad. So every year we send hundreds of students to developing countries. We should not just stay at an exchange program level. But use this opportunity to create more links between our institutions, push our students to work with their colleagues on social entrepreneurship projects.

Leanne Denby: I will add to that. When we first began to talk about what we were going to present to the outcomes document as a collaborative, one of the things mentioned was the idea of formalizing exchanges, research, and partnerships between developing and developed countries. That is something that we continue to do using vehicles such as ACTs and AASHE. The international collaboration that we have through these associations is a way to coordinate these kinds of activities.

We have so much to learn from developing countries. In a developed country, we assume we know what is happening, but the reality is we do not. We have the luxury of being in a position where we have the things that we need generally, and it is not equally shared. We know that. But we cannot make decisions for developing countries. So we need to certainly have that integration, those exchanges, that collaboration happening. There is an opportunity there for it to happen through an international collaboration, such as what we are setting up through our associations with the support of the UN.

Daniella Tilbury: The Copernicus Alliance sees the challenge for higher education to be that of the reorientation of paradigms that have traditionally informed our decision making, investment, and practice. The reality is that we have made significant advances across our campuses and through investing in sustainable procurement. However, our mainstream programs continue to reproduce the mindsets that exploit people and planet. Higher education must tackle its core business—education. It is easy to generate a new course on sustainability, which students opt (or not) to take. Some universities see these initiatives as a way of ticking the sustainability box on their “to do” list. Our view is that only through questioning and reorienting existing programs can higher education make a meaningful contribution to sustainability. This way all students have the opportunity to learn about sustainability. The embedding of sustainability competences, such as those identified by the UNECE, across the curriculum, would be an important first step.

Paul Rowland: Some of the most positive stories that came out of Rio were around the commitments made by the business community, for instance, when Microsoft made their major commitments in greenhouse gas reductions. But there was story after story about the business community stepping up while the governments were having trouble coming up with any wording that they could agree on. Is there any role here for collaboration between business and higher education since both seem to have made firm commitments to sustainability? Are there ways that the business and higher education communities can collaborate to move forward with sustainable development?

Harriet Sjøs-Jones: From the UK perspective, as an example, here at the University of Exeter, we work with the business community and businesses through the One Planet MBA, which is in collaboration with the World Wildlife Fund (WWF). Another strand we are looking at is social enterprise for sustainability. There are a lot of business-focused initiatives. The Green Economy Coalition and 50×20 are good examples. I was very encouraged by this, and I think it is a way forward.

Aurore Klepper: Our foundation is an example of this. It is a public-private structure which gathers people from university and private sectors. Fondaterra is a foundation of the University of Versailles Saint-Quentin-en-Yvelines. It is a tool for the university to create a collaborative platform to develop public-private partnerships in territories, to support the development of local value chains and green growth markets. With the program, we try to develop new courses for our students to ensure the necessary evolution of skills in the transition toward sustainable development, green economy, new local value chains, and so on. The aim is to get the private sector closer to the university and the territories to develop real-world research programs and a new service to have students placed in high demand work. Mostly we are working within the energy sectors, mobility, and urban planning.

Besides, we think that higher education can be a great test bed for a living lab. In the heart of the territories, higher education is able to gather researchers, industries, students, on open innovation. For example, Fondaterra has initiated a project on Versailles and Saint-Quentin-en-Yvelines territory with the University of Versailles Saint-
Quentin-en-Yvelines called the Urban Living Lab. This living lab has developed an ecosystem of innovation involving students, residents, local communities, associations, and companies. It supports the development of ecodistricts and new innovative sectors, in conjunction with a lively and low carbon city. This approach is relayed through the Climate Knowledge and Innovation Community created by the European Institute of Innovation and Technology (EIT), French poles of competitiveness, various European programs (for example, Internet future PPP Smartcities, CIP Eco-innovation, Interreg, FP7), and through the development of demonstrator and partnerships. The university is at the core of the project with the foundation.

Clemens Mader: There is a group of students, oikos—Students for Sustainable Economies and Management, that is pretty strong in Europe, but they are going international, with more than 30 chapters around the world. They aim to bring sustainable business perspectives into the university. So this can be taken as an example of great efforts on building up cooperations between universities and economists. They also cooperate with principles of responsible management education, and so they work in the field of how to improve curricula of management education.

JC Carteron: Well, there is one big difference from my point of view between the commitment from the companies and the commitment from higher education. The commitments from a company would come from a singular player and maybe with one or two other stakeholders. The commitments that we have done through the treaty were really a commitment of the whole higher education sector. However, one of the really interesting things in Rio is the fact that we were all on the same project with all of these various stakeholders. I was on the French delegation and there were about 200 members in this delegation—from companies, union members, NGOs, higher education, etc.

Leanne Denby: It is hard to work with the business sector as a whole because they do not come together quite as well as the higher education sector does and say, “Yes, we see this as a necessity and a way forward and a strategy that we want to embrace as a sector.” That said, we basically educate students to join the business sector. That is what we do. That is our role, to educate students to the point where they can become professionals in these businesses. So we certainly cannot avoid looking at how we work with businesses. To some degree, we need to look at how we work with subsections within the business sector, such as the accounting accrediting body, and so forth.

Paul Rowland: What do you think the long-term impact of Rio+20 might be, particularly with respect to higher education?

Daniella Tilbury: In terms of the UN process, the Rio legacy has been in the creation of the Sustainable Development Goals and a new governance framework for sustainable development across the world. Although the outcomes document was not as strong as people expected it to be, it did leave a legacy. The potential for the higher education sector to be involved in the framing of those Sustainable Development Goals is very important.

In Rio and Johannesburg in 2012 and 2013, universities were interested and participating mainly on the fringe. But at Rio+20, we saw them being a formal stakeholder in taking sustainable development forward. That is reflected in The Future We Want, which makes explicit references to the sector. It opens a door for us to not only transform ourselves and keep working at improving—step-changing the way we engage with sustainable development—while also having an influence more broadly in the way that the world is responding to sustainable development needs.

JC Carteron: The slogan of the Rio summit was The Future We Want. It is now our responsibility to capitalize on all those events, declarations, and treaties and really build a future that we want.

Paul Rowland: I want to thank all of you for participating and for all the great work you have being doing.
The UK Future of Education for Sustainable Development
– eight responsibilities for education?
The UK Future of Education for Sustainable Development – eight responsibilities for education?

~~~~~~~~

Key Questions for Post Rio +20 Event

Stakeholders, government representatives and government agencies are invited to respond in less than 500 words to the following two questions.

All responses will be collated into a future publication, aiding discourse and facilitating collaboration.

1) What supporting mechanisms should government and civil society put in place to enable and strengthen UK delivery of the educational commitments agreed in ‘The Future We Want’.

2) What actions are your organisation/institution/party taking to facilitate delivery on this agenda immediately, in the near future (by 2015), and in the longer term (next ten years).

Discussion paper

This paper aims to instigate an open discussion about how this crucial agenda can be taken forward and to investigate how Government can work with NGO’s, civil society and the private sector to accelerate constructive change for sustainability through formal, informal and non-formal education.

Eight key themes with strong educational relevance emerge from the ‘Future We Want’ (FWW). This paper extracts those themes in the order in which they appear within the document, they are not positioned in order of importance. Any extracts from FWW are italicised.

Mairi Stewart Kershaw
Education Dialogue Group, (EDG), www.edialogue.co.uk

Harriet Sjerps-Jones SFHEA
Environmental Association for Universities and Colleges (EAUC). www.eauc.org.uk

28 09.2012
1 Position of youth and children

Future We Want

24. We express deep concern about the continuing high levels of unemployment and underemployment, particularly among young people, and note the need for sustainable development strategies to proactively address youth employment at all levels. In this regard, we recognise the need for a global strategy on youth and employment building on the work of the International Labour Organization (ILO).

31. We emphasise that sustainable development must be inclusive and people-centred benefiting and involving all people, including youth and children. We recognize that gender equality and women’s empowerment are important for sustainable development and our common future. We reaffirm our commitment to ensure women’s equal rights, access and participation of young people in decision making processes as the issues we are addressing have a deep impact on present and future generations, and as the contribution of children and youth is vital to the achievement of sustainable development. We also recognise the need to promote intergenerational dialogue and solidarity by recognising their views.

Comments
At Rio+20, Heads of State reconfirmed their commitment to sustainable development and to ensuring the promotion of an economically, socially and environmentally sustainable future for the planet and for future generations. The UK is committed to effectively following up the Conference, both as a Member State of the EU and through formulating its own Country position. In September 2012, at the 67th UN General Assembly, the EU agreed to sponsor a resolution on the Rights of the Child. However, with the loss of the strong youth and child advocacy role previously undertaken by the Sustainable Development Commission 23; the strengthening of the EU 2020 4 Policy with regard to improving European youth employment within sustainable development; and the international failure of the proposal for High Level Representation for Future Generations at Rio+20; how can the UK Country position best be maintained and improved regarding the rights, responsibilities and voices of our children and young people regarding sustainable development?

2 Natural Capital Accounting

4. We recognize that poverty eradication, changing unsustainable and promoting sustainable patterns of consumption and production, and protecting and managing the natural resource base of economic and social development are the overarching objectives of and essential requirements for sustainable development. We also reaffirm the need to achieve sustainable development by; promoting sustained, inclusive and equitable economic growth, creating greater opportunities for all, reducing inequalities, raising basic standards of living; fostering equitable social development and inclusion; and promoting integrated and sustainable management of natural resources and ecosystems that supports inter alia economic, social and human development while facilitating ecosystem conservation, regeneration and restoration and resilience in the face of new and emerging challenges.

97. We reaffirm the intrinsic value of biological diversity, as well as the ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic values of biological diversity and its critical role in maintaining ecosystems that provide essential services, which are critical foundations for sustainable development and human well-being. We recognize the severity of global biodiversity loss and degradation of ecosystems and emphasize that these undermine global development, affecting food security and nutrition, provision of and access to water, health of the rural poor and of people world-wide, including present and future generations.

Comments
Is there a role for education in ensuring that social and economic capitals are referred to within Natural Capital accounting; so that the methodology of this ‘6th Capital’ 5 is a more useful metric; limiting our potential to commodify the commons and price the priceless? The UK is pioneering thinking in this area and yet meanings are being misinterpreted through language: natural capital, human capital social capital, human and social capital, natural and built capital, and economic and man-made capitals are just some of the terms used. Does the education community, through the UK Natural Capital
Committee have a position to which we can all refer?

GDP+

38. We recognize the need for broader measures of progress to complement GDP in order to better inform policy decisions, and in this regard, we request the UN Statistical Commission in consultation with relevant UN System entities and other relevant organizations to launch a programme of work in this area building on existing initiatives.

Comments
GDP is an inadequate measure of progress partly due to annual measurement timescales, inclusion only of those goods and services that move through the market, and an inherent inability to capture how the ‘products’ impact on people’s lives. The UK has started work compiling and contrasting metrics which measure ‘wealth’ and ‘value’ rather than monetary growth. Professor Stiglitz et al²⁶ cogently argue that ‘What we measure influences what we value,’ with our choice of metrics partly determining the direction of societal travel. How can we best enact the recommendations within the report, ensuring that measurements capture the relationship between education and well being throughout a person’s life, individually or by family?

4. Skills for a Green economy

59. We view the implementation of green economy policies by countries that seek to apply them for the transition towards sustainable development as a common undertaking and we recognize that each country can choose an appropriate approach in accordance with national sustainable development plans, strategies and priorities.

Comments
UK reports into evidence regarding skills and training for a sustainable future indicate that in general most businesses are unsure about which skills are required by the Green and Fair Economy.³⁷ Energy generation industries, the construction industry and the food and agriculture sectors identify specific skills; sectors identified from the outset by Education 21 as pivotal to learning for sustainable development. However the Green and Fair economy is not only about the survival of the planet but also about re-directing the economy in the context of a global economy that is increasingly collaborating over servicing a circular economy. Trends moving employers and employees toward re-skilling, flexible skilling and skilling up the workforce are integral to the Green and Fair Economy agenda but the government does not pick winners. Meanwhile education is privileging new learning with the Circular Economy,³⁷ Sc-ed³⁸, the Green Economy Alliance³⁹, and the AoC⁴¹ all exemplifying green skill training and ‘showing what we mean by a Green economy’ as recommended by the Environmental Audit Committee. Will the Government take a leadership role in determining which skill areas are considered pivotal in supporting green economy policies aiding national transition toward sustainable development?

5. Sustainable Development Goals. Re: education (229-235)

229. We reaffirm our commitments to the right to education and in this regard, we commit to strengthen international cooperation to achieve universal access to primary education, particularly for developing countries. We further reaffirm that full access to quality education at all levels is an essential condition for achieving sustainable development, poverty eradication, gender equality and women’s empowerment as well as human development, for the attainment of the internationally agreed development goals including the Millennium Development Goals, as well as for the full participation of both women and men, in particular young people. In this regard, we stress the need for ensuring equal access to education for persons with disabilities, indigenous peoples, local communities, ethnic minorities and people living in rural areas. Also see 245-250 re: process.

Comments
The UK is well placed to influence the Sustainable Development Goal (SDG) agenda, given our Prime Minister’s pivotal role in Committee; however certain NGO’s have expressed genuine concern that any SDG’s do not jeopardise the achievement of the Millennium Development Goals (MDG’s) and that Post 2015 there is a global streamlined process for development. Environmental limits or planetary boundaries could crucially factor in any new goals, which must be time-bound, deliverable and universally applicable while the UK steer in shaping the emerging SDG’s, should ensure they are as relevant to the developed world as to the
less developed world, particularly regarding education. The second MDG goals of achieving universal primary education by 2015 is a given in the UK, and while currently the FWW term ‘Quality education’ describes our desired outcome, should the education community draw on existing research around ‘Education For All’ and ESD pedagogies to clarify useful terminology and Goals for the UK?

6. ESD across formal sectors.

230. We recognize that the younger generations are the custodians of the future, as well as the need for better quality and access to education beyond the primary level. We therefore resolve to improve the capacity of our education systems to prepare people to pursue sustainable development, including through enhanced teacher training, the development of curricula around sustainability, the development of training programmes that prepare students for careers in fields related to sustainability, and more effective use of information and communication technologies to enhance learning outcomes. We call for enhanced cooperation among schools; communities and authorities in efforts to promote access to quality education at all levels.

233. We resolve to promote Education for Sustainable Development and to integrate Sustainable development more actively into education beyond the United Nations Decade of Education for Sustainable Development (2005-2014).

234. We strongly encourage educational institutions to consider adopting good practices in sustainability management on their campuses and in their communities with the active participation of inter alia students, teachers, and local partners, and teaching sustainable development as an integrated component across disciplines.

235. We underscore the importance of supporting educational institutions, especially higher educational institutions in developing countries, to carry out research and innovation for sustainable development, including in the field of education, to develop quality and innovative programmes, including entrepreneurship and business skills training, professional, technical, vocational training and lifelong learning, geared to bridging skills gaps for advancing national sustainability.

ESD in formal sectors was well defined in theory through the work of the Government Sustainable Development Education Panels of 1998, 2001, and 2003 and then through policy within the Department for Education. Sector-wide interpretation and implementation followed, resulting in Higher Education adopting both a leadership role in ESD and an innovative stance around interdisciplinary, systems thinking and resilience. Adult Education widened perceptions through ‘Learning to Last’ then focussed on sustainable skills; while the schools sector thoroughly engaged with ESD content, pedagogy and participation. Current Government priorities perhaps reside with campus and risk assessment i.e. Carbon reduction strategies and climate change adaptation and mitigation. However a new curriculum opportunity exists; to make sustainability, or more specifically ‘stewardship of resources’ a core aim of the whole school curriculum, satisfying a request from the students themselves that sustainability should be core to their educational purpose. HEFCE 18 and the Higher Education Academy 19 have also made recommendations for Education for Sustainability. Ofsted 20 highlights Education for Sustainable Development as an indicator of quality enhancement and the QAA 21 is considering guidance for curriculum enhancement processes in this area. At this juncture, could education systems usefully re-engage cross-sector dialogue around sustainable development and ESD to engender the best fit with Rio+20 outcomes?

7. ESD across informal/non-formal

231. We encourage Member States to promote Sustainable Development awareness among Youth, inter alia, by promoting programmes for non-formal education in accordance with the Goals of the United Nations Decade of Education for Sustainable Development.

Comments
Informal education sectoral ESD came late to the notice of the government Education for Sustainable Development panels of 1998-2003, but the sector proved pivotal in implementing societal and behavioural change. The third sector, Local Authorities and NGO’s continue with the informal sector leadership role; however non-formal sectors such as the media are dispersed through both public and private arenas. Would societal evolution toward a Green and Fair economy be enhanced through a new collaboration between formal and non-formal
learning for ESD? The Earth Charter articulates global values-based guidelines for a sustainable future that could be useful in exploring how formal and informal learning might interact.

8. The global dimension.

We emphasize the importance of greater international cooperation to improve access to education, including through building and strengthening education infrastructure, increasing investment in education particularly investment to improve the quality of education for all in developing countries. We encourage international educational exchanges and partnerships, including the creation of fellowships and scholarships to help achieve global education goals.

Development Education is a well-established component of ESD in the formal sector with many Schools, Colleges and Universities engaged in forging our global future.

What new platforms are needed to ensure that development education activity suits the demographics of the post Rio+20 world as well as our colonial past?

References

1. UNCSD. (June 20-22, 2012), Rio+20 Outcome Document. ‘The Future We Want.’
2. SDC. (2009 reprint), ‘Every Child’s Future Matters’. enquiries@sdcomission.org.uk
4. EU EAP, (7th June 2012), 3173rd Council conclusions.
5. First Earth Debate, NHM London, 22nd Feb 2012. ‘Beyond GDP – how can we measure progress’?
8. The Ellen MacArthur Foundation http://www.ellenmacarthurfoundation.org
9. Sustainability and Environmental Hub, Se-e-D, The Department of Education portal for ESD resources at http://www.se-ed.co.uk/
18. HEFCE, http://www.hefce.ac.uk/whatwedo/1gm/sd
19. HEA, ESD hub at http://www.heacademy.ac.uk/education-for-sustainable-development
21. QAA. ESD Curriculum change projects at: http://www.qaa.ac.uk/ImprovingHigherEducation/Pages/Leading-Curriculum-Change.aspx
Pass Project Report – Big Dilemmas Project
PASS Project Report
Big Dilemmas Project: University of Exeter

Dr Sue Rodway-Dyer
Sue Burkill
Harriet Sjerps-Jones
Contents
1. Introduction ................................................................................................................... 2
2. Context .......................................................................................................................... 2
   The Big Dilemmas Project ............................................................................................. 2
3. Case Study .................................................................................................................... 3
   Aims ............................................................................................................................... 3
   Methodology ................................................................................................................. 3
   Reflective evaluation by staff and students .................................................................. 4
   Findings – Perceived aims/objectives of the Project .................................................. 4
   Findings – Views on Assessment ............................................................................... 7
4. Rationale for the development of PFA within the Big Dilemmas Project ................. 11
5. Guidance and implications for curriculum development in Higher Education ........ 14
References ...................................................................................................................... 16
Appendix 1 ....................................................................................................................... 17
Appendix 2 ....................................................................................................................... 18
Appendix 3 ....................................................................................................................... 19
Appendix 4 ....................................................................................................................... 20
1. Introduction
The development and implementation of effective programme-focused assessment (PFA) strategies are challenging for programme teams. One reason for this is that there is a lack of suitable evidence-based guidance and exemplars. This case study forms part of the National Teaching Fellowship Scheme (NTFS) Programme Assessment Strategies (PASS) project. The PASS project aims to identify essential principles of PFA, which can then be used to implement and test the effectiveness of programme assessment strategies (Hartley et al., 2008). This case study is a contribution to that debate. The case study concentrates on approaches to PFA within the Big Dilemmas Project at the University of Exeter. The Big Dilemmas Project was launched in 2010 with the aim of creating an interdisciplinary think tank bringing together students, academics and stakeholders to investigate society’s sustainability issues.

In previous research at the University of Exeter focusing on the medical school (Rodway-Dyer, 2010) PFA was defined as assessment which focuses on stage or programme level learning outcomes (Nicol & Macfarlane-Dick, 2006). This definition has synergies with the QAA concept of ‘synoptic assessment’:

"An assessment that encourages students to combine elements of their learning from different parts of a programme and to show their accumulated knowledge and understanding of a topic area. A synoptic assessment normally enables students to show their ability to integrate and apply their skills, knowledge and understanding with breadth and depth in the subject. It can help to test a student’s capability of applying the knowledge and understanding gained in one part of a programme to increase their understanding in other parts of the programme, or across the programme as a whole" (Quality Assurance Agency, 2006).

This case study follows the potential development of PFA in relation to one programme set up within the University.

2. Context

The Big Dilemmas Project

It is necessary to have an understanding of the project itself in deciding if the project is indeed assessable and how it would sit within the context of the project. The Big Dilemmas project brings together students from across the University (from a mix of levels) with internal and external experts in a particular field (relating to global challenge) to research and report on future solutions. The Big Dilemma in 2010 focused on the Future of renewable energy in the UK: Lessons from the Severn Barrage (University of Exeter, 2011). The 2011-12 focus is on The Future of Land Use in the SW: Food, water and energy security in the face of environmental change. The Big Dilemmas project has characteristics which differentiate it from other college subjects because of the Interdisciplinary, cross university and cross level approach. At the time of conception it was thought that the project could naturally facilitate a PFA approach to assessment.

As far as pedagogies are concerned, the project has a strong problem based learning as well as cooperative inquiry focus, largely based around a 'Think Tank'. Furthermore, because it is meant to be a collaborative between academics and students very few instructions were given with regards of outcomes and outputs. It was anticipated that this could cause some anxieties amongst students because they are not used to this kind of self-directed working and learning. The expectation was
that the students would work through uncertainties and come up with creative solutions because they would be forced to explore their own resourcefulness. At all times the project leader would have a ‘plan b’ for consideration in case the think tank efforts would stall completely.

The two years in which the pilot ran saw very different cohorts with different group dynamics. In the second year it took quite a while before the group had agreed a way forward, in the words of the project leader, this was “due to a lack of clear thought leaders”. It must be noted that during this time of uncertainty the students were initially interviewed. Considering the complexity of the dilemma in year 2, it is still remarkable to see that a significant body of think pieces have been produced. This time not led by intellectual leadership within the student group, but through the coordinating inspirational editorial efforts of an English student.

The Big Dilemmas project features in the Environmental Sustainability Strategy 2010-2015 as an example of how extra-curricular education for sustainability projects could provide inspiration for curriculum innovation. The concept has now been taken forward in the Grand Challenges 2013 programme under the name 21st Century Dilemmas.

(http://www.exeter.ac.uk/media/universityofexeter/campusservices/sustainability/pdf/Sustainability_Strategy_2010-2015.pdf)

This case study seeks to inform assessment strategies for a new programme in which all first year students will participate during two weeks in the summer term.

3. Case Study

Aims
The aims of the case study are to:

1. Reflectively evaluate the underlying objectives of the Big Dilemmas project by staff and students.
2. Develop scenarios for assessing an innovative interdisciplinary project based on the Big Dilemmas project which is now running for the second year at the University of Exeter.
3. Find ways of assessing the ‘cross modular’ project and taking it beyond the extra-curricular.
4. Focus on how the interdisciplinary approaches of the Big Dilemmas project can be integrated into the teaching and programme assessment of a new Grand Challenges 2013 programme.

Methodology
A detailed case study of the Big Dilemmas project was undertaken via an examination of course documentation (including emails and the Electronic Learning Environment (ELE) Discussion Forum). An Action Research process included collaborative inquiry processes with staff and students involved in the 2010-2011 and 2011-12 Big Dilemmas projects to consider and reflect on: involvement in the project, the underlying objectives of the project and the role of assessment (Appendix 1 and
Appendix 2). The evaluation also reflected on how the learning experience could be integrated into a student’s learning programme and be formally assessed. This aimed to generate several staff/student led assessment approaches to programme assessment strategies (PASS). The scenarios are aligned with work package 3: the PASS issues paper.

The research processes also included working with the 2011-2012 team to integrate planning suggestions from the participants into the Grand Challenges 2013 programme. This completely new programme aims to embed assessment principles and pedagogic principles of the Big Dilemma to include cross modular integrated assessment. Staff members at both the Exeter and Cornwall campuses will be involved in the designing and setting up of the project and with the development of the assessment.

Reflective evaluation by staff and students
During this process, one-to-one (face-to-face) interviews were successfully conducted with 13 members of staff involved within the Big Dilemmas project at both the Streatham and Tremough campuses. This process included staff from Education Enhancement as well as academics. One invited lecturer refused to be involved and two were not available. Ten students were also successfully interviewed, again from both sites and 4 students did not respond to requests for interviews and one did not turn up. The initial questions were contextual to encourage people to think about their involvement in the project (Appendix 1 and
Appendix 2) and then these were followed by reflective questions specifically on aims/objectives and assessment. Students were also asked to email a weekly reflective diary to the researcher (13 students participated in this to varying degrees) which was combined with a record of postings from students on the ELE forum to create an excel spread-sheet recording student participation/discussion and reflections on learning. Towards the end of the project students were asked to reflectively complete an open ended qualitative questionnaire (}
Appendix 3) of which nine responded and two students volunteered to be interviewed again regarding their experience of the whole project. Appendix 4 contains a summary of the methods.

Findings – Perceived aims/objectives of the Project
The contextual questions showed that staff involvement in the Big Dilemmas project varied from those that had only been involved in the initial idea and set up within Education Enhancement, to academic staff involved over the whole two years to newly participating academics only involved this year. The difficulties of setting up the novel project and getting staff on board were highlighted by both the Head of Education Enhancement and the Project Coordinator (whose main role is as Sustainability Curriculum Development Manager). The outstanding success of the project reflects on the dedication of the driving force from the Project Coordinator overcoming barriers such as academics receiving so many requests to take on initiatives.

Staff roles include singular and multiple roles covering funding bids, launching the idea, initiative support, provision of resources, student promotion and recruitment, staff management, student mentorship, collaboration of ideas, facilitate discussion, be provocative, symposium presentations, and provide feedback on presentations and written work from students.

Students were new to this current year except for one interviewee who was a mentor following on from their involvement in the first year. They had all received an email within their college or seen a poster advertising the Big Dilemmas project, causing them to put in an application. Reasons for involvement focussed around the project aligning closely with courses (e.g. MSc in Food Security) or as an opportunity to increase their knowledge in an area which was of interest in an academic environment. Students felt this provided the opportunity to learn more about topics as well as develop contacts and networks for employability by boosting their CV. Students had also received good feedback off the previous students and academics involved within the project. Participation initially for the students meant turning up to meetings and the Think Tank discussions and participating in the forum, as well as reading up on topics.

When asked to reflectively evaluate the underlying aims/objectives of the Big Dilemmas project perceptions varied widely according to whether the interviewee was from Education Enhancement, an academic or a student (Figure 1).

The Education Enhancement staff involved in the initial idea and set up believed that the project linked curriculum with research and that it would build upon the established reputation of the University in the field of climate change. The project fulfilled part of their job targets via the bid to drive sustainability into the curriculum at the University and provided challenges regarding liaison and cross discipline communication. The project was seen to have an important message and topic. The Head of Education Enhancement also wanted to “challenge ideas on curriculum design and development with a more flexible assessment which could cut across the traditional model of subject area modules”. At the time it was thought that the project had potential to fit in with the PASS assessment objectives (see it therefore appears that the main form of assessment would need to be integrative, with the aim of influencing students’ approaches to future learning. This would be applicable across all subject areas and level of study. However, one final comment from Student B (on reflection) does question the value of assessment in rather a thoughtful way:
“My thoughts on assessment have not really changed from what I said before. It could be in the form of a diary with a tiered grading system.....it would be creative and allows for diversity.....a broad system that could cover arts and science.......peer assessment possibly. However, I think of that advert you used to get....‘priceless’. Really it should be counted as beyond value and not given accreditation....like the advert. Having it accredited won't get students involved more.”

Rationale for the development of PFA within the Big Dilemmas Project).

Most academic staff could not remember the specific aims/objectives of the project. However, all saw Big Dilemmas as something different, the opportunity to provide something extra as “added value”, especially to masters level students where they can “think outside the box”. The competitive element of selection provided kudos and helped to perpetuate this idea. The academics also saw the project as “current” due to the interdisciplinary approach and as an opportunity for staff to meet. The idea of getting scientists and humanities staff and students to mix was seen as very important for trying to understand the highly complex picture of real world issues and uncertainties. It was thought that the high profile of the project would increase awareness, enabling staff to use case study material and build it into their own assessment modules, resulting in even more people being involved in the project and creating a snowball effect.

The students all said that they had a “woolly” or “vague idea” of what the project was about but they could not say specific aims/objectives and were very unsure as to what should come out of the sessions or even the end project. The weekly diary and ELE discussions also showed that students were often unsure as to the aims/objectives of the project and what their role was. They all thought that the symposium was very good and that it was a turning point in helping them to start understanding the project. They felt that it established a sense of setting and was a “rich experience” with it being very well organised, with interesting people. They also found the field trips enjoyable, informative and valuable in helping to get to know each other.
<table>
<thead>
<tr>
<th>Education Enhancement staff</th>
<th>Academic staff</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Engage academics with an interest in sustainability and increase awareness.</td>
<td>• Provide students with the opportunity to study a broader curriculum via an interdisciplinary approach with other subject students.</td>
<td>• Debate topics from an alternative stance/different perspective and devise solutions - interdisciplinary.</td>
</tr>
<tr>
<td>• Increase the profile of sustainable opportunities.</td>
<td>• Have a common problem or issue and begin to understand different ways of looking at it — “expose students to wider viewpoints” and “develop a new generation of pragmatic environmentalists”.</td>
<td>• Bring students together to interact.</td>
</tr>
<tr>
<td>• Create showcase good practice project - on what can be done and how it can be done.</td>
<td>• Create a research driven student project.</td>
<td>• Enable students and academics to work together.</td>
</tr>
<tr>
<td>• Encourage interdisciplinary research even with curriculum differences.</td>
<td>• Take research and teaching out of the classroom and into the real world — applied questions.</td>
<td>• Produce “something” an “output”, possibly a publication.</td>
</tr>
<tr>
<td>• Challenge academic tribes and territories i.e. cultural norms about subject and learning.</td>
<td>• Enhance the student experience and skills set at the University to increase chances of employability.</td>
<td>• “To learn from experience” and the idea of “personal gain”.</td>
</tr>
<tr>
<td>• Create Interdisciplinary bridges by providing time and space to meet.</td>
<td>• Look at the issue of sustainability.</td>
<td></td>
</tr>
<tr>
<td>• Show that sustainability and interdisciplinary thinking go hand in hand.</td>
<td>• Provide a more challenging academic experience beyond the degree programme.</td>
<td></td>
</tr>
<tr>
<td>• Increase depth and awareness of staff and students on the reality of important multifaceted global challenges i.e. enlightenment.</td>
<td>• Create synthesis between academics and get them talking to each other from different disciplines i.e. “networking”.</td>
<td></td>
</tr>
<tr>
<td>• Improve student skills and employability.</td>
<td>• Provide a public relations angle for the University for “valid publicity” and “reputation”.</td>
<td></td>
</tr>
<tr>
<td>• Create a broader model of curriculum delivery.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Strategically engage high level research academics within education.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 1: Perceived aims/objectives of the Big Dilemmas project
Findings - Views on Assessment

In reflective interviews with both academic staff and students it became clear that assessment (of any kind) was not considered to be an aim/objective of the BD project, however, the staff involved in the conception from Education Enhancement had believed assessment could have a role within the project. Their recollections revolved around potential credit points available even at the different student levels, such as undergraduate and masters, and the benefits of “value added” experience. It was thought that students would not be interested in an extra-curricular activity if it did not include assessment and credit but the project was considered too challenging to include in a taught curriculum.

Academic staff and students believed that from the start, participation in the BD project was meant to be “exclusive”, where it is an honour to be selected as one of the 20 ‘Flag Ship’ students allowed access to lead researchers. It was hoped that it would allow students to “stand out” and to be “elite” which is possibly proven by the fact that “there has been no shortage of students wanting to do it”. All academic staff believed that this did not require assessment and that it would detract from the value of the experience for students. Several academics thought that the project benefited students on their courses and in one instance it had helped a student complete a public communication document. One academic said that “it is like seminars – never assessed. Students are at university to be enlightened and want to come for their own personal development”, however, in discussion the same member of staff also proposed the opposing view which was that “we live in a world where people expect to do work for credit”. Academics could see the project altering to allow assessment in the future but all academics believed it was important that it had not happened in the first few years. It was acknowledged that assessment, such as an event report or Big Dilemmas portfolio, would “act as a bit of a stick to get the students going as the early Think Tank meetings tend to lack focus” but the downside was that it could prove to be “too radical and unfeasible if it were student led because of not allowing students to go wrong”.

Assessment was clearly not a strategic aim/objective according to the academics involved in the project and this aspect of the project was therefore allowed to be pragmatically dropped. However, with the project now firmly established there is the potential to re-investigate opportunities for assessment and Figure 2 shows the advantages and disadvantages of including assessment in the Big Dilemmas project according to current staff and student views. It could be questioned whether the staff views on disadvantages of assessment are really “just excuses” or whether they are real barriers which would justify not integrating assessment into the project within the future. Questions on who would mark it only came from staff and it was not an issue considered by the students, unlike the Northumbria PASS research (McDowell et al., 2010) on assessing joint modules or at year end.

Students have given a considerable amount of time to the project and in some cases this has conflicted with coursework, such as dissertations, and exam pressures. As the project has only involved elite students, so far there has not been an issue regarding time input and grades achieved. However, several academics were adamant that it would be a mistake to include assessment at all as it would take away the opportunity for students to be “over and above the ordinary student in the job market”.

Additionally, major barriers would have to be overcome regarding university rules and regulations for assessment to happen. For example, masters students at Tremough only have formal teaching
until the February of the academic year and after that point they are doing their own research project so staff stated that the submission timings would make it impossible to include project outputs as credits. Academics asked “who would own it with the current college modules?” and it was also argued that the constantly changing group of staff for the different dilemmas would make it very difficult in establishing standards. Some academics also said that current modules were working well, did not need replacing and that they could not see a place for an additional module – “it would not be feasible for student numbers or staffing”.

<table>
<thead>
<tr>
<th>STAFF VIEWS</th>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Focus students’ minds.</td>
<td>• Operational difficulties such as how to assess across disciplines and levels and how it would actually work with university rules and regulations.</td>
</tr>
<tr>
<td></td>
<td>• “Students would get credit for their time, not just credibility” which would be fairer given their efforts in participation.</td>
<td>• Additional work for staff. Who will mark work considering staff participation is not currently acknowledged regard to work load and therefore it could “potentially put-off academics from being involved”.</td>
</tr>
<tr>
<td></td>
<td>• Staff could include commitments as part of their teaching allocation.</td>
<td>• Would not just have highly motivated students any more.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Reduce the “fun” aspect of the project.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Turn into another module with fixed assessment criteria to be met (&quot;goal directed&quot;), stopping the natural evolution of the project due the necessity for clear learning outcomes. It would cause “rigidity and structure” and become “confined by a strait jacket”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Could end up being “watered down”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Belief that students would not be interested as it would just be “main stream”.</td>
</tr>
</tbody>
</table>

| STUDENT VIEWS | • Provide a focus and make it more structured.                             | • Would stop being elitist/exclusive.                                         |
|              | • Cause people to be more innovative, motivated, more willing and possibly force discussion. | • People would just do it for credits which would be a different incentive to personal gain. |
|              | • Create student ownership.                                                | • Currently something very different.                                         |
|              | • More perceived value.                                                    | • It would add an extra layer of stress.                                     |
|              |                                                                           | • “Not everything needs to be assessed in life”.                             |
|              |                                                                           | • It would stop the evolving organic process of intellectual research (process) and just become focused on a target (output) rather than emergent thinking. |
|              |                                                                           | • It allows people to be passionate and self-motivated.                      |
|              |                                                                           | • It could possibly stop being interdisciplinary.                            |

Figure 2: Perceived advantages and disadvantages to staff and students of assessing the Big Dilemmas Project

The majority of the students did not want assessment in the Big Dilemmas project and did not think it necessary. Some said that they would not have done it at the expense of other taught module
options: one student stated that as they “pay money to be taught, there would be no point in choosing a non-taught option”. Students said it would be very difficult to assess due to the project being opinion based with no right or wrong answers and that it would not be comparable with other work commitments or other universities. Additionally, most of the students spotted issues with trying to assess across different subject areas and course levels.

Student D, a maths student, retrospectively noted: “I personally don’t see how it could be assessed as part of Maths, as it’s so subjective compared with our other work - there would be disparities between marks, which would most likely mean that not many people chose to do it, as it’s more possible to get a higher mark in right/wrong questions they would choose those modules instead.”

This idea of risk associated with a different form of assessment also occurred within the Northumbria PASS research on how students see programme level assessment (McDowell et al., 2010).

Student C retrospectively stated: “I still don’t think that BD could be assessed. I think there are already some modules in the university - such as a work experience one my friend took this year - which aren’t available to everyone, and are worth more credits than a similar module I was able to do, for the same amount of work. This gives an unfair advantage to certain students, and I think the BD project could lead to a similar thing if assessment was introduced. I don’t see how it could work fairly across all subjects. I also feel that the students involved have to have a real interest in the project for it to work, which would be less likely if it were an assessed course.”

All of the students believed it to be a worthwhile exercise and felt that they got out of it different things, which partly depended upon what individuals put into it. The majority all indicated that it fitted in with their own interests and was really comparable to political debating or being a top team sports player i.e. a high level extra-curricular activity.

Student C: “I think it’s nice to see how well you can work when you are more interested in what you are learning. However, because I was doing it alongside my degree, it was put second as I make sure I get done the things which I have to do in order to get my grades. I think I would probably have got much more involved if I didn’t have the degree to think about at the same time.”

It could therefore be suggested that some form of assessment for such an interesting project would actually improve student grades. This idea of prioritising was also mentioned by other students:

Student M: “...it was never going to be anyone’s number one priority - exams and coursework would always come first. The project doesn’t contribute to marks so why would people spend hours each week on it if it doesn’t matter for anything over all, besides an extra on the CV. Perhaps more recognition as credits may help motivate people to do this extra work at the end of term when they are drained. Changing the time frame may also help this.”

Students suggested that the project had helped to develop skills such as time management, self-confidence, broad thinking and discussion with others.

Student B on reflection: “I have had loads of learning curves: working with a group, with behaviour dynamics and learning how to tackle it.”

One student stated that “the evolving nature of the project allowed students to learn from each other. This made it interesting as the opinions and topics changed and it allowed us to open our eyes
to a wider view. We have realised that issues are not straightforward and the complexities about what goes on has come out in the discussions. That knowledge is personally useful for studies and the future. We have learnt how to get frustrated about the way things are set up”.

Student D: “In the future, I think it will help me communicate better, and find it easier to work with people who don’t approach things in the same way as I do. It has given me the confidence that I know I can work in a fairly self-guided/group-guided way rather than being told exactly what to do.”

There was a general consensus that assessment would probably need both an individual and group aspect. This would align with other assessments allowing for the individual nature of group work (“important to give credit to participation”) as well as teambuilding etc., with the mixture of presentations and written work forming the nature of Big Dilemmas. Staff and students suggested the following potential ideas for assessment or reward:

- Reflective diary or blog – this would look at the student experience and learning process throughout the time of the project and include skills mapping and outcomes such as presentations. It would help students to develop their own awareness of their learning process and enable them to make formative judgements about their future learning (Boud, 2007). Within this project it would provide ‘integrative assessment’ as described by Crisp (2012) whereby it provides an activity for students to assess their own learning capabilities and problem-solving capabilities and how this could be adapted in future learning scenarios. Thus giving students their own autonomy and sense of ownership.

- Certificate to say participated – there is potential to create a key skills (or ‘soft skills’) certificate for potential employers. In the case of Big Dilemmas it would include all nine ‘wicked’ competencies or attributes identified by Knight (2007): developing supportive relationships as seen by the group work within the project, emotional intelligence from partaking in debate and discussions, group work, listening and assimilating, oral communication through presentations, professional subject knowledge with the addition of interdisciplinary awareness, relating to clients, self-management (confidence and effectiveness) and ‘taking it onwards’ by developing outcomes. Clearly, within Big Dilemmas this also fulfils the assessment task feature of engaging students as participants in assessment design (Knight, 2007) and would incorporate such assessment rubrics as the six facets proposed by (Wiggins & McTighe, 2005).

- Option to write dissertation/thesis or provide a case study for curriculum – it would not be feasible for 20 students however, to all write their dissertation or thesis on the project.

- Link to Exeter Leaders Award – students are still doing something voluntarily but you can then get additional credit.

- Publications/publicity/final product – a mixture of written and oral (presentation) pieces of work based on the Think Tank issue. Stakeholders are involved in this. This actually forms the current finished product from the project but it is not assessed.

- Peer assessment – but this could end up assessing time and effort rather than ability. However it would provide formative assessment by involving the students by making them
make evaluative judgements about their own work and the work of other students. Again, this would provide a form of integrative assessment (Crisp, 2012).

It therefore appears that the main form of assessment would need to be integrative, with the aim of influencing students’ approaches to future learning. This would be applicable across all subject areas and level of study. However, one final comment from Student B (on reflection) does question the value of assessment in rather a thoughtful way:

“My thoughts on assessment have not really changed from what I said before. It could be in the form of a diary with a tiered grading system...it would be creative and allows for diversity...a broad system that could cover arts and science...peer assessment possibly. However, I think of that advert you used to get...‘priceless’. Really it should be counted as beyond value and not given accreditation...like the advert. Having it accredited won’t get students involved more.”

4. Rationale for the development of PFA within the Big Dilemmas Project

The issue within the Big Dilemmas project directly aligns with the PASS Position Paper on the case for PFA. This concerns the issue on ‘how to design and deliver an effective, efficient and sustainable assessment strategy which ensures that the main course/programme outcomes are satisfied’ (Higher Education Academy, 2011a).

Assessment within the Big Dilemmas project would need to specifically address major programme outcomes, not just the isolated component as part of a course. The assessment would need to bring together understanding and skills which represent programme aims.

Figure 3: The nature of Programme-Focused Assessment (Higher Education Academy, 2011b).
The Big Dilemmas project currently already has the potential to enhance subject and employability prospects without assessment.

Student C: “I think the project will help me in the future as something to talk about in interviews, and something to reflect on - both strengths and weaknesses - when approaching new projects in the future.”

Staff were found to strongly support this view. Two students stated that the Big Dilemmas project helped them to achieve success in getting placements in a highly sought after Met Office work placement scheme and one is hoping to gain a research internship at the University of Exeter. Others have been able to highlight their extra-curricular involvement within job interviews and MSc/PhD applications involving research into sustainability. The students all felt that the project had really added an extra dimension to their time at university.

Student C: “I think one of the best parts of the project was the opportunity to learn something outside of my degree, and in a very different way to my experience at university” and “I think I’ve gained confidence and new insight to how projects work, particularly seeing how people from different disciplines work together. Or maybe how slow things can move because of this... But I think it’s very useful to see. I think it’s nice to see how well you can work when you are more interested in what you are learning.”

Student I: “I’ve certainly gained a lot of experience in working across distances and with individuals with a similar outlook on the dilemmas and yet a wholly different skill-set and knowledge base from which they approach it. It goes unsaid that I gained a lot of knowledge through it.”

The main issue with having a set outcome (in the form of assessment) within the Big Dilemmas project therefore appears to revolve around the design of outcomes, which could have a restrictive influence on the creative or organic flow of the project. The answer therefore lies with integrative assessment where the students engage in the assessment design.

However, regarding the delivery of an interdisciplinary course with potential for PFA, there were clear messages from the students concerned in this project regarding the potential challenges. First, there is the question of how to resolve the tensions created by the need for development of self-directed learning as opposed to the demands of instructed learning. In this case study it appears that the facilitator needed to make students more highly aware of their role as active partners.

Second, student comments aligned closely with the suggested need for a clear framework within a sophisticated learning activity (Crisp, 2012) and if there were to be integrated assessment ‘more scaffolding’ would be required in the early stages of the assessment process.

Third is timing, another important factor commented on by all of the students who took part in the Big Dilemmas project. As Rust (2000) found, this problem of ‘bunching’ or ‘log-jamming’ clearly caused anxiety within the student body. For an interdisciplinary project such as this students will have widely varying subject commitments which will be further complicated by the different deadlines between undergraduate and postgraduate subjects. However, the facilitator felt that it was clearly explained to the students from the start that it would require excellent time keeping skills within the extra-curricular prestigious project. For undergraduate students it presents the possibility of the need for assessment to occur in the following academic year, and would therefore
link to a reflective process applied to a new project. To resolve this tension, the University has taken this knowledge to facilitate a new extra-curricular programme which will take place in the summer term after their examination period, i.e. Grand Challenges.

Figure 4 highlights the importance of institutional regulations and team-working for PFA.

![Diagram](image)

**Figure 4: The impact of Programme-Focused Assessment (Higher Education Academy, 2011b).**

Within this case study, the impact of potential PFA would cover all aspects of Figure 4, the students, stakeholders and staff. In the Big Dilemmas case study, the new ‘mindset’ and team approach to curriculum design has been highly successful in developing an innovative interdisciplinary project. However, for PFA to be successful it would require clear maintenance on the focus of the programme as well as supportive and flexible institutional regulations along with creative use of assessment regulations. The challenges of explaining the complexities of a new PFA approach across disciplines (Rodway-Dyer, 2010) would also need to be overcome.
Depending on the choice of PFA for a module such as BD, it would possibly use integrative assessment across stages or levels. The research has enabled an informed discussion regarding potential ways to assess cross modular integrated assessment modules when they are integrated into the curriculum.

5. Guidance and implications for curriculum development in Higher Education

In conclusion, this reflective analysis has highlighted some very important factors, the first being that there is great value in having voluntary non-assessed participation in extra-curricular initiatives. This perhaps concurs with the view that current practice trends tend to overemphasize the importance of assessment for progression and certification processes as presented by Crisp (2012) but also highlights the value of non-assessment.

Second, there is scope and a demand to further develop interdisciplinary activities within Higher Education:

Student Q: “The interdisciplinary nature of the project is probably its most valuable asset, but I feel like this could be pushed further.”

Guidance and practical suggestions on how to introduce PFA into the curriculum remain speculative but the students involved in the Big Dilemmas project have provided points for further exploration:

— How to resolve the tensions of the need for development of self-directed learning versus the demand of instructed learning.

— How to manage student expectations of the project better.
— How to help students to manage a demanding extra-curricular project on top of assessed programmes that take priority over the non-assessed.
References


Appendix 1

Interview questions for academics:

- Contextual questions:
  1. When were you first involved in the BD Project?
  2. How did you come to be involved?
  3. What made you want to be involved?
  4. What has been your role?

- Reflective evaluation:
  1. What did you see as the aims/objectives of the project?
  2. Was assessment discussed?
  3. Did the project lead to assessment for the students?

<table>
<thead>
<tr>
<th>4a. If YES:</th>
<th>4b. If NO:</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. How was it assessed?</td>
<td>i. Why was it not assessed?</td>
</tr>
<tr>
<td>ii. Who assessed it?</td>
<td>ii. Had you expected assessment to be involved?</td>
</tr>
<tr>
<td>iii. Who was involved and looked after the assessment with the students?</td>
<td>iii. Would assessment have altered the project?</td>
</tr>
<tr>
<td>iv. Is it possible to have an example of the assessment?</td>
<td>a. If YES, how?</td>
</tr>
<tr>
<td>v. Was it formative or summative assessment?</td>
<td>iv. How do you think assessment could have been involved?</td>
</tr>
<tr>
<td>v.</td>
<td>v. Do you think it was a good idea to design a project which, although it intrinsically motivated the students, did not allow the students to gain any credit?</td>
</tr>
</tbody>
</table>

5. Anything else you would like to add?
Appendix 2

Interview questions for students:

- **Contextual questions:**
  1. When were you first involved in the BD Project?
  2. How did you come to be involved?
  3. What made you want to be involved?
  4. What has been your role?

- **Reflective evaluation:**
  1. What did you see as the aims/objectives of the project?
  2. Was assessment discussed?
  3. Did the project lead to assessment for the students?

<table>
<thead>
<tr>
<th>4a. If YES:</th>
<th>4b. If NO:</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. How was it assessed?</td>
<td>i. Had you expected assessment to be involved?</td>
</tr>
<tr>
<td>ii. Who assessed it?</td>
<td>ii. Would you like assessment to have been included?</td>
</tr>
<tr>
<td>iii. Who was involved and looked after the assessment with the students?</td>
<td>iii. Would assessment have altered the project?</td>
</tr>
<tr>
<td>iv. Is it possible to have an example of the assessment?</td>
<td>a. If YES, how?</td>
</tr>
<tr>
<td>v. Was it formative/summative/informal/formal assessment?</td>
<td>iv. How do you think assessment could have been involved?</td>
</tr>
<tr>
<td></td>
<td>v. Do you think it was a good idea to design a project which, although it intrinsically motivated the students, did not allow the students to gain any credit?</td>
</tr>
</tbody>
</table>

5. What have you gained from being involved in BD? (e.g. graduate skills, research skills etc.)
Appendix 3

Reflective questions at the end of the project

Dear All

Firstly I would like to say a very big 'Thank you' to those of you who have kindly participated in this research aspect of the Big Dilemmas Project. Your regular emails have provided a valuable input.

Secondly, please can I get all of you to just write a final reflection on your thoughts about the project.

You are now in the final stage of the project and have possibly all been through different feelings of highs, lows and perhaps worries etc. It would be really helpful if you could just spend 5-10 minutes writing up your reflective thoughts on the project and your learning experience. You might like to reply to me with comments under the following topics:

What have been your highs and lows within the project?
How have you dealt with uncertainties and anxieties?
What have you gained from the experience?
Has being involved in the project taught you anything about your own learning process and if so, what?
How has the interdisciplinary aspect of the project helped you as a student?
How do you think being involved in the project will help you in the future?
Please can you reconsider the aspect of assessment and suggest any ways in which you think BD could be assessed in the future which might be within your subject area or a more general reflection on learning outcomes? How could this be marked?
If possible please include your ideas on how the BD project could be improved.
Finally, anything else that you can think of to say?

As always your replies will be treated with the strictest of confidence and names will not be used in any of the research.

Thanking you in advance and wishing you all the best for the future

Sue
The Big Dilemmas PASE Project

The aims of the case study are to:

- Reflectively evaluate the objectives of the Big Dilemmas project by staff and students.
- Develop scenarios for assessing an innovative interdisciplinary project based on the Big Dilemmas project; which is now running for the second year at the University of Exeter.
- To find ways of assessing the "core module" and taking it beyond the extra-curricular.
- To focus on how the interdisciplinary approaches of the Big Dilemmas project can be integrated into the teaching and programme assessment of a new Grand Challenges 2013 programme.

Potential assessment options:
- Reflective diaries or blog – this would look at the student experience and learning process throughout the time of the project and include self and peer assessment.
- Peer assessment – could be used to encourage students to develop their own assessments of their learning and enable them to make formative judgements about their own learning.
- Feedback provision and self-assessment – this could include the use of assessment as feedback to students.
- Open case study – this could be used to assess the students' knowledge and understanding of the topic.

The case study focuses on approaches to PFA within the Big Dilemmas Project at the University of Exeter. The Big Dilemmas Project was launched in 2010 with the aim of creating an interdisciplinary think tank bringing together students, academics and stakeholders to investigate sustainability issues.

The 2011-12 focus is on The Future of Lund Us in the SWI: Food, water and energy security in the face of environmental change. The Big Dilemmas project has characteristics which differentiate it from other college projects because of the interdisciplinary approach. At the time of conception it was thought that the project would naturally facilitate a PFA approach to assessment.

The Big Dilemmas project features in the Environmental Sustainability Strategy 2010-2015 as an example of how extra-curricular education for sustainability projects can provide inspiration for curriculum innovation. The concept has now been taken forward in the Grand Challenges 2013 programme under the name 21st Century Dilemmas.
Putting the 'S' into ED- Education for Sustainable Development in Education Development
Informal learning for sustainability
Jennie Winter, Plymouth University, Harriet Sjerps-Jones, University of Exeter, Barbara Dexter, Victoria University of Wellington, NZ and Joel Klaff, University of Derby

To date, progress in Education for Sustainable Development (ESD) has tended to take place within the formal curriculum but there is increasing recognition of the potential of the informal curriculum and campus environment to contribute to learning for sustainability. This chapter describes the relevance of the informal curriculum, provides examples of current practice at the Universities of Exeter, Derby and Plymouth and outlines implications for educational development.

ESD in Higher Education (HE) has received increasing political support, yet progress with embedding sustainability in the formal curriculum has been slow (Dawe et al., 2005). This is partly due to the challenges of promoting education for sustainability, necessitating pedagogic approaches which promote transformation, in the face of prevalent values which are increasingly focused on market economics.

Learning for transformation involves empowering the individual to change their perspective, in this case to one which considers sustainability, through engagement and critical reflection (Cranton, 1996). In practice it requires the integration of external phenomena; context, community and knowledge, with in-class activity (McCaleb, 1997). This has led authors to suggest that within HE, practitioners can benefit from considering how informal experiences can develop students' awareness of, and socialisation into sustainable ways of studying, working and living (Lipscombe, 2008).

Linking informal and formal learning for sustainability

Lipscombe (2008) equates informal learning for sustainability with extracurricular activities such as volunteering, internships, membership of clubs or societies and participating in sustainability focused events. In addition to these purposeful experiences, informal learning also takes place through the 'hidden curriculum' (Jackson, 1968) - the messages sent by a tutor or an institution, often unconsciously, about how students ought to think and behave. A key way in which the hidden curriculum manifests itself is through the institutional environment and structures (Skelton, 1997). In terms of sustainability, this might include provision of recycling facilities, green travel plans, or student engagement in democratic processes (Cotton and Winter, 2011). Although the labels 'extracurricular' and 'hidden' may suggest a lack of relevance to the formal curriculum, there is increasing acknowledgement of the benefits of creating links between the informal and formal curricula. Linking life-wide experience, knowledge and theory can encourage student engagement in sustainability and create opportunities for transformation. In addition to extra-curricular activities, it is also possible to develop an explicit 'campus-based' curriculum where 'learning and engagement is based upon or designed around campus-focused projects and activities' (Hopkinson et al., 2008: 435). Universities struggle to promote sustainability in part because of the complexities inherent in maintaining large organisations, yet this makes them useful and accessible examples of organisations in transition (Mackie and Jones, 2010).

The Centre for Sustainable Futures (CSF) developed a '4C model' which posits that ESD should be embedded throughout the multiple dimensions of the university (Figure 1). This positively reinforces communication about sustainability throughout the curriculum, university policies, extracurricular activities and university operations thus encouraging holistic opportunities for learning through experience and engagement (Sjerps-Jones, 2007).

![Figure 1 The 4C Model (CSF 2008)](image)

Recognising links between informal and formal learning for sustainability can help to mitigate Hopkinson et al.'s (2008: 439) observation that 'the student experience at most universities typically has a fragmented connection of the values, ideals and practical aspects of living, studying or working in a sustainable way.' This is also evidenced by Kagawa (2007: 320) who notes the opportunities...
Chapter 4 Informal learning for sustainability

for utilising the campus as a catalyst for exemplifying the interconnectedness of social, economic and environmental interests creating a ‘sustainability orientated pedagogy of place’. She argues that this can help address the common perception of sustainability as solely concerned with the environment, rather than the triple bottom line of environment, economy and society. The case studies from Exeter and Derby provide innovative examples of how the dimensions of campus, community and curriculum can be fused to enhance informal learning opportunities. The role of educational developers in these projects has been key, and indicative of the potentially wide range of activities which can fall within the remit of enthusiastic teams.

Case Study one: University of Exeter’s ‘Campus as Living Laboratory’

The concept of ‘Campus as Living Laboratory’ (Cortese, 2010) offers a focus for coordinating informal learning opportunities with the formal curriculum, based on the principle that:

‘...students must experience sustainable living first hand and be involved in helping their schools become powerful role models of sustainable practices for the rest of society.’ (Cortese, 2010)

The University of Exeter is committed to sustainability throughout its campus operations, research, knowledge transfer and student learning. The university has interdisciplinary research themes in climate change and sustainable futures, and is a collaborator in sustainability projects including the Wave Hub off the Cornwall coast. It also engages with local businesses and charitable organisations through knowledge transfer partnerships. In recent years, it has committed to provide all students with the opportunity to learn about sustainability issues, resulting in a unique opportunity to review and rethink teaching and learning practices and link research, campus operations, and knowledge transfer to the curriculum to create a learning environment that promotes formal and informal learning for sustainability.

The principle behind this approach is for the campus to serve as a living laboratory for identifying, evaluating and assessing indicators of progress toward sustainability. It enables the development of a powerful interactive learning relationship between students, academics, campus staff and community. So far, Campus as Living Laboratory (CLL) projects at the University of Exeter have included:

• Improved communication about campus greening initiatives through a variety of media and campaigns
• Active support for ‘Student Switch Off’ and ‘Degrees Cooler’ campaigns sponsored by the National Union of Students
• ‘Students as Change Agents’ initiative - a collaborative endeavour involving the Education Enhancement department, and Guild of Students
• Sustainability research-informed teaching using real-world examples
• Increased volunteering opportunities related to biodiversity with local conservation charities
• Engagement of the local community through collaborative learning initiatives, highlighted by the ‘Biobltiz’, described below.

An example of how CLL activities have contributed to informal learning for sustainability is a biodiversity enhancement campaign delivered in partnership with campus staff, academics, students and Devon Wildlife Trust. The launch of the campaign was marked by a ‘Biobltiz’ - a quick and fun census of species, in October 2010. A group of 150 experts, student volunteers and members of the community surveyed a sample area of the campus over two hours, with promotion from the TV wildlife presenter, Nick Baker. Whilst academics and local wildlife experts helped with the identification of species, the students and community volunteers acted as stewards to collect data which lead to some interesting practical outcomes:

1. Collaborative campus community learning
   The ‘Biobltiz’ spawned a plan to enhance those pond habitats which had low species diversity. A staff member worked with biology students to do a more detailed survey and identified minor interventions which could enhance biodiversity. Grounds staff learned more about the relationship between horticultural interventions and habitat protection and enhancement.

2. Development of new skills
   Student feedback suggested that they enjoyed the combination of learning about biodiversity, gaining practical skills and making new friends. The majority of respondents indicated an increased interest in biodiversity.

3. Ownership and sense of place
   The participating students enjoyed the ‘Biobltiz’ to such extent that they now engage with other sustainability focused activities. The intimate engagement with their natural environment gave them a sense of ownership of their temporary campus ‘home’ motivating them to take additional positive actions.

4. Inspired curriculum
   Academics in biosciences have been inspired to work with their students on site, to learn
practical surveying skills and make a positive difference to their direct environment. The ponds are now the focus of an on-going surveying project to monitor habitat health and species richness.

The CLL has proven to be a valuable test bed to coordinate and galvanise learning for sustainability and has started to inspire the formal curriculum. The University is seeking to build on these initial successes and extend the range of ‘lab experiments’ in coming years.

Case study two: University of Derby’s sustainability festival

The University of Derby (UoD) is a post-1992 university, with a strong commitment to the community, and engagement with environmental sustainability principles. It has Fairtrade University designation and works closely with charities and community projects. A major recent refenestration project, together with the introduction of wind turbines and solar panels, is helping to make the university more energy-efficient. In the area of teaching and learning, sustainability is one of seven key themes in the Learning, Teaching and Assessment Strategy 2009-2011, containing points for both curriculum development and educational development (University of Derby, 2009).

<table>
<thead>
<tr>
<th>4. Sustainability</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 Ensure that the principles of sustainability and environmental awareness are covered in all programmes</td>
</tr>
<tr>
<td>4.2 Increase staff awareness of sustainability principles with regard to programme design and delivery</td>
</tr>
</tbody>
</table>

| 1. Identify the essential principles of sustainability for application in modules |
| 2. Require programmes to apply the sustainability principles in programme design and practice |
| 3. To provide staff development relating to sustainability |
| 4. To encourage staff to embed and demonstrate sustainability principles in their own Learning, Teaching and Assessment (LTA) practice |
| 5. Provide funding for sustainability-related Teaching informed by Research projects |
| 6. Investigate how to improve LTA practice |

The issue of what ‘sustainability’ in curriculum design and delivery really meant (and how educational developers might guide academics) was an early concern for staff. Moreover, it was not necessarily clear exactly how the concept fitted with other institutional agendas which included employability, personal development planning, and volunteering. To this end, discussions were held at various committees and staff development events, and some small project funding was made available to academic colleagues to consider and develop possible theoretical underpinnings. The aim of these discussions was to open up rather than close conceptual boundaries of ESD, noting that ‘limiting conceptions of a subject are often related to limiting approaches to teaching that subject’ (Reid and Petocz, 2006: 106). We explicitly used an open-ended approach to ESD which was well aligned with the UoD’s values of social change.

Following these initial discussions, a proposal started to develop around an innovative extra-curricular offering for Spring 2011, the ‘Sustainability Festival’. Based on Pettigrew and Whipp’s (1991) three dimensions of strategic change (context, process and content), the festival aimed to showcase examples of sustainability in practice at the university. The initiative took shape when a small group of committed individuals came together to talk about how we could promote sustainability through informal learning opportunities. We identified several examples of good current practice in ESD across various programme areas, including architecture students’ involvement with a local practice to improve sustainability in new, existing and listed buildings, and a technology project short-listed for the 2010 e-Legacy award. However, the group identified difficulties in gaining engagement with any single project and dissemination. It was only on the short walk back to the main campus that Barbara and Joel (co-authors of this chapter) considered the idea of a jointly student/staff-led sustainability conference, embracing all faculties and sites, and allowing the student voice to come through strongly. The name of the event was subsequently changed to ‘Sustainability Festival’ to suggest less formality and to be more celebratory of the work being showcased.

A number of factors helped to make the event successful. Firstly, the initial organisers used our networks to build a wider management group with representatives across the faculties and from the Student Union. Each faculty had a representative on the working group, who in turn brought in champions from other departments, including Estates and the Career Development Centre. A range of committees and individuals were consulted at an early stage and invited to take part in the festival. The festival was also promoted through the Student Union, the
Assistant Deans and Senior Teaching Fellows in each faculty. Some behind the scenes activity was initially undertaken to secure the support of influential staff colleagues and the Student Union. Finally, the enthusiastic support of the Pro Vice Chancellor Learning and Teaching was critical in giving the initiative early momentum.

The Sustainability Festival was held at two main sites in Derby over a two day period. It was set against the backdrop of various critical challenges that face our graduates: climate change, the rapid depletion of natural resources, the spread of infectious diseases, the loss of biodiversity, the violation of human rights, increased poverty, lack of regeneration of urban communities and economic dependency on consumerism. The overall purpose of the festival was to raise awareness of the importance of these issues and open debates about how ESD can be incorporated into our curricula, student experience and university policies. The festival also provided an opportunity for voluntary and not-for-profit organisations involved in climate, conservation, social and economic themes to participate and contribute to the development of university curricula and policies.

The types of engagements and displays that took place were:

- Student and staff posters and video loops to demonstrate how their modules raise awareness of sustainability issues
- Student and staff discussions, debates, presentations, mock trials, negotiations, storytelling, poetry readings and films on relevant sustainability and social responsibility issues
- University departments such as Estates and Catering offered displays and presentations promoting their sustainability strategies
- Voluntary organisations hosted discussions on topics such as sustainable living, sustainable foods, conservation and sustainable communities.

Overall, the festival strived to ensure that we have the formal policies, procedures, pedagogies, curricula, modules and informal learning opportunities that can help lead to a sustain future and equip our staff with the skills to integrate ESD into their courses and equip our students to become responsible citizens locally, nationally and globally. At the time of writing, the festival has been invited to apply for an INSPIRE award, linked to the 2012 London Olympic Games, to recognise our contribution to sustainability in education. In this context, the university recognises that the commitment to sustainability is a continual process and the festival will continue as an annual event to keep the momentum going in years to come.

Case study three: Plymouth University’s guidance for campus-based learning

Plymouth University is a post-1992 institution with an institutional commitment to sustainability. Sustainability is a key theme in both the Teaching and Learning Strategy (ULP 2009a) and Research and Innovation Strategy (ULP 2009b). Plymouth also enjoys a nationally recognised reputation for sustainability, and hosts the Centre for Sustainable Futures (CSF) which, amongst many other activities, generated a sustainability policy based on an integrative institutional-wide approach (Figure 1), established a network of sustainability fellows, created a Student Union garden and supported the Student Union 'Green Week' (Mackie and Jones, 2010). However, despite these efforts, recent research by members of the Educational Development (ED) team into students’ perceptions of campus-based sustainability found that students associated sustainability on campus with a limited number of eco-friendly behaviours. These included recycling and energy conservation - the most visible manifestations of sustainability on campus - yet even within this limited remit students reported inconsistent and confusing messages (Winter et al., 2010). In addition, they were largely unaware of the university’s considerable track record in sustainability and found it difficult to access in-house data on environmental performance. The ED team drew on this research and other campus-related projects (Mackie and Jones, 2010) to develop resources with which to build links between the campus and formal curricula, to increase student awareness of the university as an organisation is transition, and to enhance student capacity to recognise and critique the hidden sustainability curriculum at Plymouth. The following guidance (Figure 3) was developed and has recently been disseminated throughout our academic community. Although this resource was developed to fit the Plymouth context it is potentially applicable to other Higher Education Institutions (HEIs).

1. Share with students what sustainability issues the university is addressing

Recent research at Plymouth University (PU) found participating students unaware of the university’s achievements in sustainability (Winter et al., 2010). However, institutional contexts which promote sustainability are essential for ESD to become transformative (DEFRA 2005). This suggests that signposting the University’s sustainability achievements is key to creating a culture based on sustainability principles.

Practical pointer: Tell students about the University’s national track record in sustainability.
The University is currently ranked number one in the People and Planet Green League for environmental performance, has been awarded silver status for corporate social responsibility (Universities that Count) and has been accredited with ISO14001 for environmental management. Sustainability has a strong presence in both the University’s Teaching and Learning and Research and Innovation strategies.

2. Adopt appropriate pedagogic approaches

ESD is best taught through student-centred pedagogies which promote collaborative learning, utilise discovery and problem-based approaches whilst also challenging individual values and behaviour (Sterling, 2004).

Practical pointer: When designing sustainability-focused learning activities, encourage students to work in groups to explore different perspectives on sustainability and set up research questions which prompt discovery learning. Using visual media can help students bring the campus to the classroom.

3. Utilise the physical campus in teaching and learning for sustainability

Strengthening links between education and estates can promote greater understanding of the challenges universities face when attempting to implement sustainability (Orr, 2004). This can be communicated to students through using campus based examples within a disciplinary context.

Practical pointer: Hopkinson et al. (2008) suggest that estate projects could include sustainability principles in design and operations. Similarly, environmental performance data has the potential to be used in a variety of disciplines such as teaching statistics, well-being and inclusivity in the social sciences or procurement in the business disciplines.

4. Raise awareness of environmental, social and economic dimensions of sustainability

Sustainability is a multi-dimensional concept which encompasses environment, society and economy. However, research at PU demonstrates that students perceive sustainability uni-dimensionally in relation to the environment at the expense of social and economic dimensions (Kagawa, 2007). Encouraging students to learn about and critique sustainability in its broadest sense can help students to develop awareness of the different dimensions as well as the connections between them.

Practical pointer: Teaching and learning activities can explore themes such as environmental impact, social and economic wellbeing, global citizenship, volunteering, community involvement and corporate social responsibility in the campus environment.

5. Challenge students to consider their own values and behaviour

Reorienting individuals’ values and behaviour in favour of sustainability is an important component of ESD. Institutional cultures impact on sustainability values and behaviour (DEFRA 2005), therefore exploring campus sustainability with students can encourage students to evaluate critically their own experience of, and response to, sustainability.

Practical pointer: Get students to discuss what sorts of values are associated with sustainability, how these are communicated by the University and to what extent these are manifested in the campus environment. It may be useful to explore the ways that students are encouraged to reflect these values through behaviour, for example, what kinds of pro-environmental behaviours are facilitated (or not) on the campus.

6. Invite students to contribute ideas for improving sustainability on campus

Democracy, participation and inclusion are key principles of sustainability and therefore an essential part of communicating ESD to students. Using the campus as a vehicle for learning about sustainability should therefore provide students with opportunities to identify areas of unsustainable practice and to suggest improvements.

Practical pointer: Learning activities can focus on particular buildings, resources, processes, health and safety or stakeholder groups to identify (un)sustainable practice and propose improvements.

7. Measure sustainability

How the sustainability of resources and activities is conceptualised and measured is increasingly important. Raising students’ awareness of the university’s monitoring processes can help develop skills for implementing sustainability in organisational settings.

Practical pointer: There are a number of internal and external indicators used to evaluate sustainability at the university. Getting students to critically evaluate indicators and to develop their own can help them to engage with this aspect of sustainability on the campus.

Figure 3  Guidance for using the campus for learning about sustainability
This resource has been very well received, and the availability of a brief and practically-focused resource has provided opportunities for the ED team to bring sustainability to a wider audience.

Implications of informal learning for educational development

The examples presented here can be used as inspiration for developing strategies to link the distinct but inter-dependent constructs of formal, informal and campus-based curricula in HE contexts. Of course, not all universities will have the motivation, interests or capacity to develop institution-wide initiatives to pursue sustainability, or to explore informal learning opportunities to the extent of those documented here. However, the continued political intention that HE be a catalyst for sustainability orientated social change suggests that educational developers should take note of this relatively new pedagogic territory as it receives increasing attention.

Currently, sustainability initiatives are often overlooked by lecturers who are unsure how to create links between disciplinary content and, for example, external organisations, sustainability-focused events or university operations. This is where educational developers can offer guidance and support to lecturers interested in pursuing campus-based learning opportunities. Educational developers can provide guidance on the following:

- The importance of integrating formal and informal learning for creating opportunities for transformation

- The relevance and application of student-centred, participatory pedagogies which promote real-world experience for promoting engagement with sustainability

- How sustainability links with other university agendas - for example, employability, social enterprise, local communities, personal development planning, knowledge transfer, volunteering and work-based learning

- How to make connections between what are often disparate and disconnected university departments such as the academic community, procurement, estates and the student union

- Where and how to access data about environmental performance, sustainability indicators, and organisations which benchmark sustainability in university organisations

- How other HEIs, disciplines and academics have made links and lessons learnt from their endeavours.

Linking informal learning to the formal curriculum can be achieved through designing co-curricular activities which bridge the formal and informal spheres. Work-based learning and independent study modules offer possibilities as do knowledge transfer schemes and the increasingly prolific Higher Education Award Schemes. It is also worth noting that the new Higher Education Achievement Record (HEAR) will expand on the traditional degree classification to include detail of students’ extra-curricular achievements, making life-wide learning experiences increasingly relevant to the formal curriculum and of increased value from the student perspective.
Bringing it home - tackling global challenges in a local context

Harriet Sjerps-Jones

with Anka Djordjevic

Introduction

The University of Exeter has an excellent reputation in research for environmental sustainability. In recent years it has established interdisciplinary research themes such as ‘Climate Change and Sustainable Futures’ that works closely with the Met Office and the Intergovernmental Panel on Climate Change (IPPC) and has launched the Environment and Sustainability Institute at its Cornwall campus. During the same period, the University has made significant steps in carbon reduction and the ‘greening’ of its campuses. In this context, the University’s senior leadership identified the need to bring the taught curriculum in line with these achievements and to weave sustainability into the fabric of the curriculum so that all students achieve a basic level of sustainability literacy.

Challenges of contrasting and competing agendas at universities and colleges in the UK

Over the past decade, Higher Education Institutions (HEIs) in the UK have felt the pressure of balancing research and teaching budgets with the increase of student numbers and quality of provision. Building on a reputation of good quality higher education, HEIs in the UK have turned to recruiting students from abroad to supplement funding and allow for expansion. A cap on the numbers of home students per HEI gave rise to further emphasis on international recruitment.

The introduction of higher tuition fees and a cut in government funding for HEIs following the recently published Browne Review of higher education funding means a further change to priorities at Universities. It is expected that the quality of the student experience (value for money) and graduate employability will get more emphasis (to pay back student debts). The report states that ‘Student choice will drive up quality’ and that ‘Providing students with clearer information about employment outcomes will close the gap between the skills taught by the higher education system and what employers need.’ (Browne et al, 2010). Herein lay challenges as well as opportunities for Education for Sustainability (EfS).

At the University of Exeter the following priorities that at the surface compete with EfS have been identified:

1) Employability
Graduate jobs vs life long careers
Each year the Higher Education Statistics Agency publishes statistics of the percentage of graduates per institution that have found employment within the first six months after graduation. With the increase in tuition fees up to £9000 per year, students are expected to pay more attention to league table performances. Universities are sensitive to league table ranking and the University of Exeter is no exception in wanting to do well in league tables as well as wanting to help students to find employment. As EfS focuses on graduate
attributes such as interdisciplinarity, systems thinking, adaptability etc, there is a concern that in the rush for employment specialism for instant jobs will win over more rounded graduate attributes for a lifelong career. The challenge is to link EfS to employability. The Government’s chief scientific advisor John Beddington stresses that

“by 2030 the world will need to produce 50 per cent more food and energy, together with 30 per cent more available fresh water, whilst mitigating and adapting to climate change. This threatens to create a ‘perfect storm’ of global events.” (Beddington, 2009)

In less than twenty years current students will be mid career and will probably not have paid off their study debts. Are we preparing students for this perfect storm? Will their careers be resilient enough to cope with these global challenges? Recent research into first year students’ attitudes towards sustainable development (Agombar and Bone, 2011) highlights that

“80% of respondents believe sustainability skills are going to be important to their future employers and the majority of first-year students involved believe that it is the role of universities and courses to prepare them for graduate employment.”

Although the emerging ‘Green Economy’ is an obvious opportunity to link EfS with ‘Employability’, the Green economy is often associated with applied skills such as retrofitting of homes and renewable technology. It is crucial to articulate that the Green Economy also requires skills for leading behavioural change, risk assessment, auditing, negotiating dilemmas, creative problem solving etc. Beddington stresses that

“On water, managing and balancing supply and demand for water across sectors requires a range of policy and technological solutions. Meeting the demand for energy, while mitigating and adapting to climate change, will require a mix of behavioural change and technological solutions.” (Beddington, 2009)

And as stated in the recently published UNEP report on the Green Economy we also need to “rethink and redefine traditional measures of wealth, prosperity and wellbeing.” (UNEP 2011:624)

This will all have an impact on graduate careers.

2) Internationalisation
- International student recruitment vs Global Citizenship
Because of its associated carbon footprint (long haul flights etc) Internationalisation is often seen as counterproductive in University’s ambitions to become more sustainable. However, there is a great opportunity for awareness raising of the global sustainable development agenda through cultural exchange; the internationalisation of home students (learning about global issues through interaction with fellow students) as well as opportunities for international students to learn about sustainability principles and to apply them back at home. For example, the Business School’s One Planet MBA (in collaboration with WWF) is a hot bed for international students who will apply insights for sustainability back home. One recent graduate from Brazil offers her vision for her future: “After graduation, I want to be responsible for a project where I can use my knowledge to help develop some community or country, or maybe even help solve global issues.” and a student from South Africa: “I envision myself carrying these experiences forward into post-MBA life – finding ways to
create value for society, the environment and the local economy through harnessing peoples’ prospects for dignity and full participation in their own lives.”

3) Corporate responsibility
- International impact vs local responsibility
Although International impact has been identified as an important theme at the University of Exeter, local responsibility remains important too. This is expressed through Research and Knowledge Transfer (RKT) projects with a regional focus, support for the development of the Science Park in Exeter, and the Environment and Sustainability Institute in Cornwall. In particular the latter has a remit to stimulate businesses initiatives in the South West and to strengthen a regional low carbon economy. The Clear About Carbon project (www.clearaboutcarbon.com) that is spearheaded by the Business School is a good example of how that could work. Clear About Carbon is a European Social Fund financed project with a mission to find new ways to increase carbon and climate awareness within businesses and the public sector. Working with staff in Cornish organisations, the project aims to identify the most successful methods of engaging them to green the public sector supply chain.

The University is also demonstrating corporate responsibility through the support of local farmers and cutting co2 emissions through local purchasing. For example, its procurement strategy, to buy local food. ‘26% of the University’s non-pay spend is with local suppliers (within Devon)’ already (Sustainable Procurement Strategy, 2010) and the University’s Sustainable Food policy commits to preference to source eggs, poultry, milk and meat from Devon (Sustainable Food Policy, 2011). Another example is the University’s commitment to promote the reuse of furniture and goods at student halls (Re-use project). The average student generates between 10 and 20 kg of reusable items a year, including stationery, kitchen appliances, books, clothes and bedding. Often these things are thrown away at the end of term, although many are in very good condition. This scheme enables unwanted items to be donated to local community organisations or to existing or new students. This means that as well as cutting waste, the scheme helps provide affordable items to the community. At Exeter, we divert over 3.5 tonnes of material from landfill each year via this project.

4) Student experience of teaching and learning
Post Browne Review there is a clear emphasis on the quality of the ‘student experience’ as mentioned above, this include the demand for increased contact hours, better feedback and quality of teaching.

- Research intensive vs teaching intensive
This is a challenge for research intensive Universities such as Exeter. There is a risk that the focus of academics could be diverted too much from teaching in order to achieve 4 star rated research. At Exeter, a way forward has been found in the development of research-led teaching, ensuring that students have access to world leading research and have the opportunity to engage in research like activities.

- Academic freedom vs Academic responsibility
A popular argument used by those opposing the introduction of centrally driven agendas such as sustainability is that it is important to defend the ‘academic freedom’ of lecturers. The underlying assumption of some academics is that the lecturer, e.g. the expert, knows what is best for the student and therefore should decide what is taught in modules and
programmes. EfS can be seen by some as an unwelcome interference with specialist centric teaching. It also does not help that Sustainability and Sustainable Development are ‘umbrella’ terminologies that have little appeal to the academic specialist and could be seen as too generic and vague because they include research ranging from climate change to behavioural change. Academic freedom is certainly essential for the sake of independent thought and research, however it is important to balance this freedom with the responsibility lecturers have for students and to also embrace student empowerment. The University of Exeter (QAA, 2010) takes the approach to

“...engage students as partners in shaping and leading their own educational experiences through our successful and growing ‘students as change agents’ initiative. The key concept is that students themselves take responsibility for bringing about change, based on their own research on aspects of learning and teaching.”

As a consequence there are four approaches to student engagement, the student as evaluator, participant, co-creator/expert and change agent. In particular the latter approach, the student as change agent, enables students to be actively engaged with the processes of change. Based on research and evidence of a need for change, students have the opportunity to lead the way in curriculum development. Students’ interest in sustainable development, as mentioned above under point one, could help challenge those lecturers who use ‘academic freedom’ as an excuse for lack of engagement.

- Knowledge vs experience and reflection

EfS requires a review of course contents to give students the opportunity to learn about the latest solutions and approaches to tackle unsustainable practices. Many critics of the current state of Higher Education (HE) argue that it ‘lacks the ability to respond fully to the sustainability crises’ (Sterling, 2001) and that it requires different approaches in teaching and learning and to appreciate ‘the culture of education as an expression and manifestation of the wider cultural milieu’. (Sterling, 2003). Many EfS practitioners refer back to educational reformist John Dewey who declared that ‘education must be conceived as a continuing reconstruction of experience’. (Dewey, 1897) (in contrast to the prevalent ideas of his time, where a student was seen merely an empty vessel, on whom knowledge should be transferred). The social environment and the student’s experience and reflection is very important in the learning process (Kolb, 1984), however more than a century later this paradigm still prevails to some extent in HE. Kolb & Kolb observe that much of the current educational practice is based on the model ‘where preexisting fixed ideas are transmitted to the learner’ (Kolb A. and Kolb D, 2005). In contrast they propose six alternative assumptions that are summarised here:

- Learning is best conceived as a process, not in terms of outcomes.
- All learning is re-learning.
- Learning requires the resolution of conflicts between dialectically opposed modes of adaptation to the world. Conflict, differences, and disagreement are what drive the learning process.
- Learning is a holistic process of adaptation to the world. Not just the result of cognition, learning involves the integrated functioning of the total person—thinking, feeling, perceiving, and behaving.
- Learning results from synergic transactions between the person and the environment.
- Learning is the process of creating knowledge.
This is very much in accordance with the paradigm for EiS. ‘Critical & reflective thinking’ is an important pillar of Education for Sustainable Development in Higher Education Institutions (Dawe et al, 2005) as well as systems and interdisciplinary thinking. The environmental educator and researcher David Orr has argued for interdisciplinary teaching over many years:

“We educate many in-the-box thinkers who perform within their various specialities rather like a dog kept in the yard by an electronic barrier. And there is a connection between knowledge organised in boxes, and the ability of those minds to perceive the causes of degraded ecologies and global imbalance” (Orr, 1994:7)

The sustainability literate graduate will need to have specialist knowledge as well as the ability to understand global systems from different perspectives and disciplines:

“Solving sustainability problems requires expertise. Often multiple, different types of knowledge have to be brought to bear to address sustainability problems which typically involve chemical, biological, ecological, sociological, economic, legal and psychological aspects. Yet the expertise that is necessary to address such problems can often get in the way of finding solutions: people working in particular disciplines can often struggle to hear and understand the perspectives of those working in other disciplines. For this reason the skills and knowledge which are necessary to enable different disciplines to effectively work together — interdisciplinary literacy — are an integral and necessary part of sustainability literacy.” (Tormey et al, 2009)

Universities need to consider to move from a seminar style delivery of the curriculum to an inquiry based reflective learning style to allow students to make sense of sustainability challenges that go beyond specialist knowledge.

Reconciliation of agendas and engagement

So, how to negotiate the aforementioned minefield of competing agendas and create a culture that embraces and promotes EiS? How can we find the right approach to engage academics? How can we empower academics and students in the face of a crowded curriculum? To reconcile these seemingly contrasting agendas at the University two strategies were considered: to agree on a top-down approach with directors of education in each discipline or a bottom-up approach through the implementation of inspirational interventions. The risk of a top down approach is that it is very difficult to reach a consensus of how to instigate changes to the taught programmes and that it could end up as a ‘tick box exercise’. The risk of a bottom up approach is that good practice could stay isolated in pockets without achieving any change at institutional level. However, from an engagement perspective it is more effective to lead through example and illustrate how EiS can inspire the curriculum with concrete examples of good practice.

For these reasons it was proposed to trial a co-curricular interdisciplinary project over a period of two years. Following Co-operative Inquiry strategies, that have been proven successful in my earlier work around student engagement with the sustainability agenda (Sjerps-Jones, 2007), academics were invited to be involved with the design of the project from the start. Co-operative inquiry, or Participatory Research, aims to “empower people at the second and deeper level through the process of constructing and using their own knowledge.” (Reason, 2003) Although some initial ideas and potential delivery strategies
were offered as starting point, they were encouraged to find solutions to the delivery of the project as well as having an input in the contents. This approach significantly improvement ‘ownership’ amongst participating academics and resulted in a collaborative two-year pilot programme between academics, students and stakeholders that aims to tackle complex regional sustainability dilemmas: the Big Dilemmas Project

Case study: Bringing it home - tackling global challenges in a local context
The project offers students a unique opportunity to learn about the complexity of sustainability challenges and the moral and practical dilemmas that affect any decision making. In the first pilot year (2010 -11), a group of twenty students were selected from across the University, through a competitive application process to join a think-tank guided by academic experts. Most of the participating academics are involved with the University’s interdisciplinary research theme Climate Change and Sustainable Futures and have experienced at firsthand how difficult it can be to overcome disciplinary barriers. This was of great help to the students who had no previous experience of interdisciplinary problem solving. The aim of the think-tank was to scrutinize issues and deliberations around the Severn Barrage tidal energy project that was shelved by the Coalition Government in 2010 ignoring the Sustainable Development Commission’s ‘enthusiasm’ for tidal energy (SDC, 2007). The fact that a contentious ‘live’ project was scrutinised and stakeholders were invited to explain their positions made it interesting for both academics and students. Focussing on a local project made it easy for students to engage with stakeholders and it made them realise that learning tackling sustainability challenges at a local level is similar to tackling issues at a global level and that in fact it is impossible to separate the local from the global.

At the start of the project, an introductory symposium contrasted priorities around protection of biodiversity with climate change and local economy. This was followed by a series of think-tank meetings and a field trip to the Severn estuary led by broadcaster and naturalist Nick Baker. The field trip in particular made a big impact on students and academics alike. There was a different appreciation of the scale (size) of the project as well as the value of the natural environment. One of the students commented about the fieldtrip:

“I loved it. I really love that sort of landscape, you know, from a poetic point of view, not from an ecologist’s point of view. That really, sort of bleak, open landscape. For a human being, it gives you something psychologically that lots of places don’t, and I think it’s quite important. (...) I think that there is an intrinsic value, but I don’t think it’s taken into account a lot of a time, because when people do start talking about those intrinsic values, they are accused of being ... overemotional and you usually get bracketed as an environmentalist, which is a really intriguing word for me, is that what I am?”

The opportunity to make a difference in an actual challenging situation and propose a way forward was inspiring and stimulating. The think-tank students acted as champions within their programmes of studies, inviting their peers to symposia and engaging them in discussions. Further to tackling dilemmas with regards to the Severn Barrage, the students acted as change agents. Through their dialogues with the academics, they contributed to a re-think of teaching paradigms for sustainability in the formal curriculum and helped to shape co-curricular learning opportunities that encourage ‘future resilient’ attitudes. If
anything, they learned about the complexity of interrelated systems and the difficulty of solving sustainability challenges:

“Right at the beginning I thought ‘a big dilemma, we’ll try and solve it’. But even amongst the biologists we couldn’t agree on what the effect on the Severn would be, even with Nick Baker, and certainly with the interdisciplinary aspect of this group. I don’t think we really could definitely say one way or the other. The facts seem to say ‘don’t build it’, but then there is a huge rather persuasive argument that says perhaps we should take a risk and try it. I think we are still very, very split, and that really goes to show that it is a really big dilemma.”

However although the dilemmas were not completely solved, with the help of some guidance from the academics the students came to some sound proposals to approach the developments of big renewable energy projects in the future. They focused on three themes: Energy Policy & the Business Case, Ecosystem Services and Engaging with the Publics. It was interesting to see that students did not stick to their own disciplines. For example a mathematics student and biology student joint human geographers to study public engagement and NIMBYism (Not In My Backyard attitudes). Another biology student worked with a mathematics student and economy student on ecosystem services. Their final presentations at a stakeholder facing symposium were well received by the audience. They are summed up in the following feedback comments:

“I totally support the organisation of this kind of events so big dilemmas can be discussed and showed to the professionally interested and general public. It was very interesting to know that specific studies are being conducted to analyse the Pro's and Con's of implementing controversial measures, like the Severn Barrage.”

and

“Great stuff - should have engaged the big dilemma approach and students before spending the millions on consultants”.

Summary
So, what were the benefits of this project in relation to the four competing agendas at Exeter University?

1) Employability: Graduate jobs vs life long careers. The students involved have increased their direct employability as this co-curricular project is an excellent addition to their CV. Two students secured coveted internships at the Met Office on the back of these projects; others are still continuing their studies so it is early days. They have certainly had a very valuable experience in interdisciplinary thinking and dealing with complexity as well as getting an insight in energy policy and dealing with NIMBYism.

2) Internationalisation: International student recruitment vs Global Citizenship
Two out of twenty students were from abroad and brought valuable insights to the group. One geography student (MA Climate Change and Risk Assesment) from Trinidad made the group think about the predicament of poorer countries who are facing climate change impacts and have no capital to invest in large renewable energy structures such as a tidal barrage. In his view the economic issues in the UK were futile and in his opinion richer
countries had the moral obligations to invest all they can to reduce green house gasses. These kinds of discussions were equally valuable for home students and international students alike. Equally, this student is now applying the experience and knowledge gained from this project back at home where he is responsible for coastal protection.

3) Corporate responsibility: International impact vs local responsibility. Engaging with a contentious regional issue was very valuable for students, academics and stakeholders alike. The University of Exeter can make an impact in developing a low carbon economy in the South West through collaborative ‘stakeholder facing’ projects such as the Big Dilemmas project. It is valuable to draw on the expertise from internationally acclaimed researchers and apply their knowledge at a local level. At the same time lessons learned from local projects can be applied at an international scale where possible.

4) Student experience of teaching and learning

The project was a good example of how interdisciplinary and experiential learning can make a difference and lead to a deeper kind of learning as proposed by Kolb & Kolb and EfS advocates such as Orr and Sterling. The students have gained a lot of confidence in the subject matter of renewable energy, ecosystem services and engagement with publics, topics that link to their discipline but are not typically covered. They have learned to overcome disciplinary differences in research approaches and language and they have also learned to use an inquiry based or research-like approach to learning that equips them not only with transferable skills for employability, but also gives them a taste of what research is about. Further, the project also demonstrates that academics are happy to involve themselves with EfS as long as they are empowered in their academic freedom and are encouraged to approach sustainability from their own research interest’s perspective.

The Big Dilemmas project has demonstrated how EfS can join-up and enhance the many agendas such as employability, research-led teaching and internationalisation. The students and academics’ enthusiasm for the interdisciplinary inquiry-based and experiential learning has been contagious. The approach has offered inspiration to further curriculum development in the Business School and summer school activities across the University. The project is very much in accordance with David Orr’s vision for learning for sustainability:

“I propose that we engage young people and faculty together in the effort to solve real problems. I do not propose such efforts as ‘service’ projects alone but as ways to integrate learning with service.” (Orr, 2005)

However, the challenge remains to make this kind of inquiry based teaching core and not offer it as an add-on, as the programme is currently only accessible to a limited number of students and offers no accreditation.

What is next?

The case study of the Big Dilemmas project demonstrates that it is possible to reconcile apparent competing agendas at Universities through a co-curricular project. Co-curricular projects have the advantage to allow for curriculum innovation which would be difficult to instigate in the existing curriculum because it is often seen as crowded and conservative in approach. The example of this interdisciplinary sustainability project provides inspiration for an alternative to traditional programme and module design. It not only reconciles agendas that on the surface seem to contradict, but also inspires because a real difference
can be made to local communities. It also offers an opportunity to challenge existing paradigms for teaching and learning and promote experiential approaches. The challenge is to also formalise EIS at a programme review and level and ensure that good practice is woven into all taught programmes. The role of accreditation needs to be explored further too. The competitive nature of the Big Dilemmas project attracted ambitious students who were not depending on awards through study credits. However, if we want more students to take up inquiry based experiential learning, away from the traditional lecture theatre, accreditation mechanisms should be examined thoroughly. Here ‘students as change agents’ could be involved in the process to develop an appropriate accreditation or award system.

References

Agombar, J. and Bone, E., (2011) *First-year attitudes towards, and skills in sustainable development*, The Higher Education Academy


Browne et al (2011) *Securing a sustainable future for higher education - An independent review of higher education funding & student finance*


Dunne, E, Huntechinson, J. and Kay, J , 2010. *Rethinking the values of higher education - students as change agents?*, QAA


Bio Blitz: a tool for the promotion of entomological science
Purpose

This article but is aimed at raising awareness of the value of what has been broadly labelled “citizen science” (see Silvertown, 2009) for promoting entomological interest in young people and the public at large. Specifically, this article concentrates on a technique, the BioBlitz, which forms one aspect of the Biodiversity Enhancement Plan (BEP) deployed by the University of Exeter for its own campus grounds.

We hope that, by the end of the article, readers will not only have a better idea of the value of BioBlitzes but will also see the need to be proactive in offering their help with such events whenever the opportunity arises.

The case of the University of Exeter

The University of Exeter’s Streatham campus is well known for its spacious landscaped grounds. Part of the green lung of the city of Exeter, these grounds provide a wide range of habitats for local wildlife. Viewing historical records, however, has shown that some species more vulnerable to environmental change have disappeared from the campus grounds in recent years, for instance the grizzled skipper butterfly (Pyrgus malvae).

Major investment at the University is enabling the Streatham campus to undergo re-development, expanding its capabilities, and providing new buildings and infrastructure for its future security, but this will inevitably place greater pressures on the campus wildlife. This concern, however, is on the radar of the planners and the University aims to help restore the natural habitats that will be impacted. It further intends to create wildlife corridors that will link its flora and fauna with other green spaces in the City of Exeter thus helping wildlife to permeate through the built environment.

To give this strategy focus and momentum, last October a biodiversity enhancement campaign, called the ‘Birds & Bees’, was launched in partnership with Devon Wildlife Trust, Exeter Wild City and other community stakeholders. The start of the campaign was celebrated with a BioBlitz event, led by broadcaster and naturalist Nick Baker. A group of over 150 volunteer students, Bioscience academics, experts, enthusiasts and members of the public joined Nick, a University of Exeter graduate, for what also been called a ‘speed census’ of species on the Streatham campus. The aim was to find as many species as possible and collate these data with existing records to build better knowledge of the biodiversity present.

An important additional aim of the BioBlitz was to educate participants in conservation and the science of wildlife. This was in support of the University’s Education for Sustainability Strategy that includes formal and informal learning about sustainability and addresses issues that include climate change, social and economic fairness, and protection of biodiversity. Volunteering students, academics and other experts helped members of the public with finding and then identifying organisms as accurately as possible. The next phase of the Birds & Bees campaign is to write a biodiversity enhancement plan in collaboration with Devon Wildlife Trust and to further engage academics and students through surveying and habitat management projects.

A concrete example of what can be done is how the BioBlitz has informed further surveying work. The data collated on the day, although far from complete, gave an indication of the poor quality of biodiversity in the ponds. A group of students volunteered to help with the survey of one of the bigger ponds that was due to be dredged because there was a health problem with the carp. The analysis of the survey has informed our estates team how the pond can be improved for the carp as well as for wildlife.

What are the opportunities and benefits?

There are many benefits of the scheme for the University’s students, academics and the local community. For students, working with the public offers them the opportunity to translate specialist knowledge of biological diversity into easy to understand basic principles. They also get to learn practical
leadership skills, develop surveying knowledge, and enjoy enriched co-curricular learning. It gives students opportunities too for the development of citizenship and enables them to help make a real difference for biodiversity on their ‘home patch’.

For the academics too, there are benefits. The Natural and Environmental Research Council (NERC) is recommending that funded researchers get involved with such initiatives. This is echoed by the UK Research Council’s statement “that public engagement should be a part of every skilled researcher’s portfolio. Engaging with a non-specialist audience can enhance skills including improved communication and influencing skills.” (RCUK, 2011[3]). Further, it gives academics the opportunities to really help make a difference in the protection and conservation of the natural environment. For the general public, it provides an opportunity to learn what biodiversity is about, how it all works and why it is important. For all concerned, academics, students and public alike, the scheme intends also to help provide a sense of place, ownership and an enhanced engagement with the environmental sustainability agenda.

BioBlitz concept

BioBlitzes have been around since the term was first coined in 1996 during an event in Washington DC (see Wright, 2010[1]) and have been held worldwide. National Geographic reports that “The BioBlitz engages students and members of the public in experiential ecological education, and demonstrates why it’s so vital to conserve our natural resources”.

Commenting on a large BioBlitz held in Connecticut in 2003, one of the original organisers (Sam Droge, a wildlife biologist at USGS Patuxent Wildlife Research Center) captures the spirit of BioBlitzes: “...a lot of publicity, kids are involved, the press comes – they whoop it up”.

Anyone can organise and run a BioBlitz although there is a formal home for UK BioBlitzes at the British Natural History Consortium (BHNC), which co-ordinates major BioBlitz events and engages volunteer experts from all over the UK.

A contributing factor to the success of BioBlitzes is the competitive element, a race against the clock, that contrasts a traditional field studies approach. A BioBlitz restricts the time frame in which to find as many species as possible. To get deep knowledge of the biodiversity requires time for study, but the aim is more to create engagement and help to raise awareness. In the case of the University of Exeter, other elements included in the hunt were to find the ugliest, prettiest and ‘deadliest’ species on campus. Of course beauty and ugliness are subjective, but a candidate for the prettiest was surely the kingfisher, and for the ugliest, one of a myriad bugs (Hemiptera: Coreidae) with oversized eyes. The ‘deadliest’ was a rather passive hornet although another strong contender was a fly agaric.

Benefits for entomological science

The big picture

Much has been reported and discussed in Antenna over recent years about the decline in entomological science and the loss of field work and “whole-animal” studies from compulsory and post-compulsory education, summed up well by Doring in 2009[4]: Getting younger and the wider public engaged with entomology has also been recently aired in Antenna by Wootton et al. (2010)[5], although the topic has a long history.

By working at University level, engaging academics as well as students and bringing in families and young people, BioBlitz events have a real chance of sparking deeper interest in entomology, especially if there are entomologists present to direct and inform. Even more so if these entomologists are also members of the organisation running the event.

Areas of particular value

Recording presence, absence, frequency and associations of insects. At Exeter we used the presence and the absence of particular species to determine the relative “health” of individual habitats (eg through “key indicator” species and diversity analysis such as that used in the University’s Reed pond assessment) and of the habitat mosaic of the whole area being surveyed.

The value of BioBlitzes to identify invasive species has been noted in Edwards (2010)[6]. Our Exeter event was no exception with the first find of the day being a specimen of Leptoglossus occidentalis, a large “leaf-footed bug” (Hemiptera: Coreidae) which is pest of pine trees imported from the USA that has become established in Europe and the UK in the last 10 years[7]. Luckily a local expert, and Devon Wildlife Trust volunteers had encountered this bug before as a pest and could confirm its identity.

Presence/absence is also of interest to national recording schemes (a key feature of BioBlitzes – see the BHNC website[8]) and to regional and local specialist groups who may also have historical data for added value. For such data to be of use, however, there needs to be high confidence of its validity, which can be an issue for such events (explored further below). The University’s event recorded two new regional records (as far as we can tell), one for the recently established bumblebee Bombus hypnorum and another for the diving beetle Agabus punctatus. Confident determination of these two records depended on local bumblebee expertise and time for an experienced freshwater biologist to check the diving beetle through a key.

Educating the wider public and raising awareness. BioBlitzes attract lots of people of very wide backgrounds and ages; our Exeter event included local residents, staff and their families and students on campus from a range of academic disciplines. One of the most rewarding observations was the way bioscience students were helping those who had come just along for a “pond-dip” identify the diverse freshwater invertebrates and share nuggets of their recent learning.

Educating young people – the future for entomological science. Clive Betts, as REŠ’s Youth Development Officer ran a number of successful “field trip” style events which were organised to focus solely on education. The BioBlitz approach swaps the focus from education onto finding and recording which means expert help is fundamental to BioBlitzes, education is
With poor weather forecast we prepared for indoor activities with a slide presentation on standby and all computers and microscopes under cover. We also prepared for large numbers of participants with plenty of student stewards to help with crowd management and data collection. As it happened, the weather was good and there were more participants than expected. With so many participants we became concerned that the collection of data sheets could be chaotic so a last minute draw was organised as an incentive to hand in the forms at the end of the afternoon.

During the event all our experts contributed to the party atmosphere with anecdotal and loud revelations ("look at the legs on that..." referring to a specimen of the chrysomelid beetle *Psyllodes* under a microscope). Judging our special finds of the day (mentioned above) added a great sense of fun and sparked heated debates amongst the experts. Specimens were displayed on tables and experts gave a five minute round-up of their favourite finds at the end of the day.

According to the British Natural History Consortium that coordinated BioBlitzes around the same time, we had a high number of participants compared to other events. Of course it was a great advantage that the event was spearheaded by a well known television presenter (Nick Baker), but feedback tells us that the public were also drawn by the opportunity to learn from experts including lecturers and professors. We received many requests to repeat the event from expert volunteers, students and members of the public alike.

**Conclusions and what next?**

We are convinced that running BioBlitzes on campus will prove to be a valuable environmental planning and assessment tool for the University's Biodiversity Enhancement Plan. Our Estates team are engaged with the plan and willing to learn what improvements can be made and deliver recommended changes. Our job is to make sure we have an appropriate strategy in place so that changes are indeed improvements and deliver greater biodiversity.

Identifying precisely what "improvements" means is not simple and includes consideration of a wide range of factors such as land usage, our quasi-urban location and even our legal covenants (Nilon, 2011) includes such factors in an interesting perspective on urban biodiversity). Our current focus is a "birds and bees campaign", both are visibly affected by recent campus changes and both are recognised as important indicators of habitat health (eg Williams et al., 2010; Gregory and van Strien, 2011). Our BioBlitz data were fairly good for birds, almost absent for bees. With bees in particular we run headlong into the data quality issue. Even the commoner bumblebees can be misidentified fairly easily and the rarer/declining solitary species, which would be of greater interest, require authoritative determination.

However, we are taking small steps and will try to address all these issues as we encounter them: any action is better than none, providing we are careful with the changes we recommend for the benefit of particular taxa and can join up our work with other local projects (for instance the "Exeter Wild City" project run by Devon Wildlife Trust).

So, what about entomologists? We urge you all to get involved with all such events as often as possible: your skills and enthusiasm are greatly needed and are always hugely appreciated.

**References**

7. http://www.edina.ac.uk/digmap
Engaging the local community with biodiversity enhancement
at the University of Exeter
Engaging local communities with biodiversity enhancement at the University of Exeter

Professor Charles Tyler and Harriet Sjerps-Jones

The University of Exeter's Streatham campus is well known for its spaciously landscaped grounds. Part of the green lung of the city of Exeter, these grounds provide a wide range of habitats for local wildlife. Viewing historical records, however, has shown that some species more vulnerable to environmental change have disappeared from the campus grounds in recent years. Major investment at the University is enabling the campus to undergo re-development, expanding its capabilities, and providing new buildings and infrastructure for its future security, but this will inevitably place greater pressures on the campus wildlife. This concern, however, is on the radar of the planners and the University aims to help restore the natural habitats that will be impacted. It further intends to create wildlife corridors that will link its flora and fauna with other green spaces in the City of Exeter thus helping wildlife to permeate through the built environment. This endeavour offers a unique opportunity to engage our students, staff and wider community with building a more detailed picture on the biological diversity of the campus, raising awareness of the rich resource available for study, and creating a community of practice involving student, citizen and specialist (staff) volunteers. This will not only help to gather valuable data that will inform an enhancement plan, but will also tap into the enjoyment that can be derived from engagement with the natural environment – the 'green gym' at work. The Natural and Environmental Research Council is strongly promoting citizen science and community engagement of its funded researchers.
To give this strategy focus and momentum, last October a biodiversity campaign was launched in partnership with Devon Wildlife Trust, Exeter Wild City and other community stakeholders. The start of the campaign was celebrated with a community facing Bioblitz event, led by broadcaster and naturalist Nick Baker. A group of over 150 volunteering students, academics, experts and members of the public joined Nick, a University of Exeter graduate, for a ‘speed’ census of species on the Streatham campus. The aim was to find as many species as possible and collate these data with existing records to build better knowledge of the biodiversity present. A further aim of the Bioblitz campaign was to educate participants in conservation and the science of wildlife. Volunteering students, academics and other experts helped members of the public with surveying and identification of species.

What are the opportunities and benefits?

There are many benefits of the scheme for the University’s students, academics and the local community. For students, working with the public offers them the opportunity to translate specialist knowledge of biological diversity into easy to understand basic principles. They also get to learn practical leadership skills, develop surveying knowledge, and enjoy enriched co-curricular learning. It gives students opportunities too for the development of citizenship and enables them to help make a real difference for biodiversity on their ‘home patch’. For the academics there are benefits too. Natural and Environmental Research Council is recommending that funded researchers get involved with such initiatives. This is echoed by the UK Research Council’s statement “that public engagement should be a part of every skilled researcher’s portfolio. Engaging with a non-specialist audience can enhance skills including improved communication and influencing skills.” (RCUK, 2010). Further, it gives them opportunities to put into practice their knowledge, skill sets and enable them to really help make a difference in the protection and conservation of the natural environment. It is also possible to do ‘real science’ in such schemes to build knowledge that will help secure local biodiversity for the future. For the general public, it provides an opportunity to learn what biodiversity is about, how it all works and why it is important. For all concerned, academics, students and public alike, the scheme intends also to help provide a sense of place, ownership and an enhanced engagement with the environmental sustainability agenda.

What are the keys to its success?

Multiple Engagement Strategies
The scheme has started well, largely because of the energy and enthusiasm from a wide body of people who want to help make a difference. Importantly, the scheme first sought to secure support from lead academics, senior managers and campus staff (grounds staff, Health & Safety etc). Equally important, has
been the recruitment of passionate wildlife experts with local knowledge, including retired academics. Strategic recruitment of volunteers, exploiting the power of ‘peer to peer’ recruitment, involvement of the student Biosciences society and the setting up of a dedicated Facebook group have been key approaches for bringing in students into the scheme. Engagement of the local community has been through a local Sixth Form College, inviting A level biology students, advertisement through the University’s established local community newsletter and open invitation to University staff and their families.

Value for money
Getting started is not expensive (and this helps in the present climate!). For the Bioblitz event, a small pot of external seed funding covered basic costs of consumables and the University’s conference and hospitality unit sponsored refreshments. Devon Wildlife Trust and the Biosciences faculty lent surveying equipment, literature, and microscopes.

The involvement of wildlife TV presenter Nick Baker, helped raise the profile of the Bioblitz event and biodiversity protection scheme at Exeter. His good looks, charm and all round infectious enthusiasm for wildlife will certainly have contributed to the attendance of more than 150 people at the event. Feedback, however, is telling us that it was equally attractive to participants to have the opportunity to talk with the University’s academics and get an insight in the positive and practical contributions that science can make to society. After the event, we received several requests to hold more Bioblitz events.

Another contributing factor to the success of this ‘citizen science’ event was the competitive element of a Bioblitz that contrasts a traditional field studies approach. A Bioblitz restricts the time frame in which to find as many species as possible. Of course to get deep knowledge of the biodiversity on the campus requires time for study, but this initial event was more to create engagement and help build momentum for raising awareness. This race against the clock made the event more engaging and other elements were included in the hunt were to find the ugliest, prettiest and deadliest species on campus. Of course beauty and ugliness are in the eyes of the beholder, but a candidate for the prettiest was surely the kingfisher and for the ugliest, one of a myriad of bugs with oversized eyes! The ‘deadliest’ was a rather passive hornet and no one was harmed in the event, although a few late season midges drew a little blood here and there (thanks to those ‘volunteers’ for putting in the ‘extra’). On the Bioblitz day 49 species of birds, 2 species of amphibians (common frog and palmate newt), 1 species of fish, 73 species of invertebrates, and 99 species of fungi were recorded. Not bad for one afternoons work in October.
What are the plans for the future?

We were pleasantly surprised that the Bioblitz campaign attracted interest from such a wide audience. Students came from various disciplines, not exclusively from biosciences. Feedback analyses reveals that they enjoyed the combination of learning interesting facts about biodiversity on campus, meeting like-minded people and learning practical skills. The majority of students said that their interest in biodiversity had increased. It is suggesting that the event has given them an opportunity to take ‘ownership’ of their campus, which has led to a greater sense of responsibility for their immediate environment. A group of students promptly volunteered to get involved with further pond surveying and other environmental sustainability initiatives. Positive feedback has also been received from the public. At the event Nick Baker commented:

“When I was a student here, there was not the same kind of interest in the protection of the natural environment as nowadays. I am delighted to see that so many students have shown their support today.’

The Bioblitz event is only the start however, and we intend to build on its success and the momentum generated to engage as many as possible in trying to ensure that we build a better understanding of the local biodiversity. Through shared learning with the students and public alike we will try to ensure that wildlife on the University’s Streatham campus and more widely in the local community has the opportunity not only to exist as developments proceed, but to thrive. Success of the Bioblitz events - there is another, bigger and better (24h) one planned at Exeter for this summer - will be measured by the legacy that they are intended to help support – the diversity of plants and animals that are found here in the future.

University of Exeter 2011

New Media, an effective tool to engage students with the sustainability agenda

Harriet Sjerp-Jones is a fellow of the Higher Education Learning Partnerships CETL, and the Centre for Sustainable Futures at the University of Plymouth. Here, she outlines her project to explore students’ engagement with the sustainability agenda.

In 2006 I was awarded a combined fellowship with two Centres for Excellence in Teaching and Learning (CETL) at the University of Plymouth. My aim was to explore how students could be engaged effectively with the sustainability agenda. Two years ago, a colleague, Prof. Al Gore’s An Inconvenient Truth, the meaning of ‘sustainable development’ (SD) was not well understood and ‘Climate Change’ was scarcely debated amongst students, making research into student engagement timely.

As a Design lecturer at one of the fifteen partner colleges of the University, I focused on working with Art and Design students. I conducted a survey with a selected group across three colleges in order to get a picture of how the students felt SD is being communicated to them at College. The survey was a means of seeing interesting patterns in student responses about general levels of engagement, empowerment, future expectations, fears and influences on thinking and behaviour. The results were used to design discussion topics with cooperative inquiry groups at each College.

The inquiry groups were full of interesting discussion. One of the main ideas emerging was that there are three types of students in regards to sustainability: the engaged student, the receptive student, and the sceptical student. The majority of students are receptive students, namely those that are receptive and sympathetic to messages about sustainability issues, but remain passive. These students develop a more active approach when they receive positive stimuli in the areas of their social network, the curriculum and formal policies (see Figure 1 for the influences on them at college). However, if there are conflicting messages in these three areas, these students tend to disengage.

Clearly students need to see consistency between the messages they are receiving and daily life on the campus, whether this means, for example, recycling or sustainability in the curriculum. The engaged students and sceptical students are not likely to change attitudes because of external factors at college, but they form a potentially big influence on receptive students who could easily be persuaded either way.

The receptive student will only become engaged if these three influence areas are favourable towards sustainable development. If they are not favourable or absent the receptive student will sit on the fence and the engaged student will be disempowered.

The participating students felt that being treated as passive recipients of knowledge was not effective in generating SD awareness and engagement. They also proposed that it would be helpful for the engaged students, who often feel isolated, to have means to collaborate together. This understanding, which was shared amongst all participants, led to a proposal to design a website together to facilitate social networking and sharing of knowledge on sustainability across the University and Partner Colleges.

After a pilot with Art and Design students other students are now joining in and developing the website further. Having learned from the research, Somerset College has recently developed a college-focused interactive website within the existing Moodle intranet, it engages students and staff with sustainability issues and facilitates cross-curricular learning. It is based on the same interactive principles as the university website, but has a detailed focus on the journey to sustainability at the college itself. The website features regular updates for progress made with recycling, the reduction of the carbon footprint and offers practical tips. There are also discussion forums and relevant support materials for formal teaching and learning.

Today’s students engage with information differently than a generation ago. We need to understand the different cues that engage students, how to make information ‘sticky’, and how to make the colleges a place where students feel inspired talking about, sharing and debating contentious issues. This project has shown that new media could play an important role when it comes to engagement.

Harriet Sjerp-Jones
sjerpj@gipse.co.uk
http://csf.plymouth.ac.uk/greenhouse
http://help-cetl.ac.uk
Centre for Sustainable Futures CETL

Reference:
1. Higher Education Learning Partnerships CETL and Centre for Sustainable Futures CETL