Chapter 3

'It's Not Just Bits of Paper and Light Bulbs': A Review of Sustainability Pedagogies and Their Potential for Use in Higher Education

Debby Cotton and Jennie Winter

Sustainable development is a way of thinking about how we organize our lives and work – including our education system – so that we don't destroy our most precious resource, the planet ... It must be much more than recycling bottles or giving money to charity. It is about thinking and working in a profoundly different way (Department for Education and Skills [DfES], 2006, p6).

Introduction

In 2005, the UK Government published its sustainable development (SD) strategy *Securing the Future*, which endorses education as a major vehicle for raising awareness and building a skills base for sustainability. This document promotes sustainability literacy as a core competency for graduates and professionals in the workplace, and encourages universities and colleges to 'raise the profile of sustainability literacy in all curricula' (Department for Environment, Food and Rural Affairs [DEFRA], 2005, p151). The HEFCE also produced an SD strategy and action plan in 2005 that endorsed ESD, followed up by a strategic review three years later (HEFCE, 2008). These strategies were updated in 2009, in the light of consultation with the HE sector, culminating in a document that identified higher

education as 'a major contributor to society's efforts to achieve sustainability – through the skills and knowledge that its graduates learn and put into practice' (HEFCE, 2009, p3). Among other things, the HE sector is encouraged to 'develop curricula and pedagogy that will give students the skills and knowledge to live and work sustainably' (HEFCE, 2009, p21). Here, then, is clear support at a national strategic level for sustainability pedagogies in UK HEIs.

This emphasis is reflected in some parts of the academic literature by authors who view higher education as offering an unrivalled opportunity to provide leadership on sustainability: 'Given what academics know about the current ecological condition of the planet, there is an obligation for universities to become leaders in the movement to prevent global ecological collapse' (Moore, 2005, p326). Increasingly, sustainability is being seen as an integral, cross-cutting theme in HE, rather than being consigned to specific parts of the curriculum such as environmental science and geography (Haigh, 2005). Viewed as an institution-wide issue, sustainability has the potential to become 'a gateway to a different view of curriculum, of pedagogy, of organizational change, of policy and particularly of ethos' (Sterling, 2004, p50), drawing together campus changes, curriculum development and pedagogic reform. This reflects a move away from the conception of ESD as embedding prescribed, pre-defined content into curricula towards an understanding of sustainability as a different way of thinking and of teaching. Recent research has investigated the extent of this conception among university lecturers and the impact of changing pedagogies instead of – or as well as – the content of university programmes (see Cotton et al, 2007 and 2009). The findings suggest that there is considerable support for utilizing innovative pedagogies to teach sustainability.

Despite the strategic developments and conceptual advances that have occurred in ESD, development of HE curricula and pedagogies in practical terms has been 'patchy' at best (Dawe et al, 2005, p4). The HEFCE strategic review in 2008 observed 'very disparate ESD activity across the sector', and much of the activity in HE has thus far been focused on campus greening rather than on pedagogic reform (SQW Ltd, 2006). Moving towards an increased emphasis on sustainability offers a profound challenge to all systems of education, but perhaps especially to HE. Some in the sector remain sceptical about incorporating sustainability into the curriculum. Fears about indoctrination that inhibited the introduction of environmental education in schools have resurfaced in the light of the current interest in sustainability and still haunt the ESD agenda. One vociferous opponent has been Peter Knight, who writes:

> *[The HEFCE SD strategy] is one of the most pernicious and dangerous circulars ever to be issued. It represents the final assault on the last remaining freedom of universities ... It is not the job of universities to promote a particular political orthodoxy* (Knight, 2005).

Responses such as this have led some to comment that 'the higher education sector is one of the hardest sectors in which to institutionalize sustainability' (Junyent and de Ciurana, 2008, p764).

Even where individual tutors are committed to the inclusion of sustainability, other factors may make it difficult for them to implement its principles in their teaching. For example, the complexity and lack of clarity around the terms 'sustainability' and 'sustainable development' inhibit ESD teaching innovation by many in academia. Scott and Gough (2003, p2) describe sustainable development as 'a set of contested ideas rather than a settled issue', so its inclusion in the curriculum is an ongoing challenge. Although it might be argued that the controversial nature of such issues offers fertile opportunities for the use of exciting and innovative pedagogies – and indeed sustainability appears to invite interactive, discursive teaching methods – the dominant pedagogy in HE is lecturing, generally favouring one-way transmission of information. Furthermore, the interdisciplinary nature of sustainability requires a change in mindset for academics, who are generally accustomed to working within clearly defined disciplinary boundaries.

Nonetheless, despite these constraints there are a large number of alternative pedagogies that have been used successfully in both secondary and higher education and which will be reviewed in this chapter. There is also increasing evidence to suggest that 'in general, good sustainable development pedagogy is often simply good pedagogy' (HEFCE, 2008, p34); thus it is potentially an attractive option for HE practitioners and fits well with a broader move towards more constructivist, learner-centred approaches in HE (Biggs, 1999).

Sustainability pedagogies

Sustainability pedagogies have emerged from an initial focus on environmental education compartmentalized as *about*, *in* and *for* the environment. Education *about* the environment focuses on declarative knowledge and provides the learner with information about environmental systems and issues using approaches designed to investigate and discover. Education *in* the environment capitalizes on the environment as a real-world resource for enquiry and discovery that can enhance the learning process and challenge traditional understandings of metacognition. Education *for* the environment conceptualizes the transformative (and contentious) component of environmental education. It requires the development of a 'personal environmental ethic'; the values and attitudes that motivate behavioural change in favour of the environment (Palmer and Neal, 1994, p19). From these beginnings, alternative pedagogic approaches have emerged, promoting inclusive forms of communicating knowledge based primarily on dialogue and experience (Scott and Gough, 2003) that have remained a central feature through the movement away from the traditional interests of environmental education towards the wider concept of ESD.

There are a number of general principles regarding sustainability pedagogies including participatory and inclusive education processes, transdisciplinary cooperation, experiential learning and the use of environment and community as learning resources; all of which involve student-centred and interactive enquiry-

Table 3.1 *Integration of sustainability in HE*

Integration of sustainability within higher education implies shifts

From	To
Transmissive learning	Learning through discovery
Teacher-centred approach	Learner-centred approach
Individual learning	Collaborative learning
Learning dominated by theory	Praxis-oriented learning linking theory and experience
Focus on accumulating knowledge and a content orientation	Focus on self-regulative learning and a real issues orientation
Emphasis on cognitive objectives only	Cognitive, affective, and skills-related objectives
Institutional, staff-based teaching/learning	Learning with staff but also with and from outsiders
Low-level cognitive learning	Higher-level cognitive learning

Source: Sterling, 2004:58; adapted from Van den Bor et al, 2000

based approaches to teaching and learning (Fien, 2006; Rasmussen, 2008; Sterling, 2004). It is clear that many of the core principles of integrating sustainability into HE require substantial shifts in thinking and practice that may be out of reach of the individual lecturer and more challenging for some disciplines than others (see Table 3.1).

The difficulty of negotiating transformative changes to curricula – which are themselves within the boundaries of a wider (and largely traditional and conservative) educational system – has been raised by Sterling (2001). However, recent research (Cotton et al, 2007 and 2009), carried out with the the University of Plymouth's CSF, shows that academics in a wide range of disciplines are making changes to their teaching to incorporate sustainability into the content of their curricula, despite highly variable institutional support for such activities. What is perhaps more difficult is promoting the changes in pedagogies that sustainability seems to require. Tilbury (2007, p119) notes that, 'more and more we are seeing the word sustainability being added to the titles of programs, projects, activities, departments or units – however, few have actually been redesigned to address new social learning approaches'. This is perhaps simply because the pressures on HE militate against such changes – the increasing marketization of HE on a mass scale make participatory, collaborative approaches problematic. However, there may be wider impediments at work: previous research has identified lack of curriculum time, perceived irrelevance of sustainability to some disciplines (see Box 3.1) and lack of a shared understanding of the terminology as barriers to the growth of sustainability pedagogies (see Dawe et al, 2005, for a discussion of some of the issues).

Why do we need different pedagogies for sustainability?

The need for different approaches for teaching about sustainability (and previously environmental education) has been under discussion for some time and is

---

Box 3.1 Is sustainability relevant to your discipline?

Much of the literature on integrating environmental or sustainability issues into higher education focuses on campus greening alongside the possibilities for incorporating sustainability-related knowledge into relevant subject areas (e.g. Heinz Family Foundation, 1995). However, recent research by the University of Plymouth has investigated the ways and extent to which academics incorporate sustainability across all parts of the curriculum, as well as exploring their understanding of sustainability pedagogies (Cotton et al, 2007 and 2009). Throughout this chapter, we will draw on interviews and analysis undertaken as part of this research to illustrate key points.

The Plymouth research findings suggest that although there might appear more plentiful opportunities for incorporating sustainability into teaching in certain disciplines (such as environmental science or geography), there is no obvious correlation between subject area and the belief of staff that sustainability is relevant to their discipline. It seems that tutors who are personally committed to sustainability are likely to see it as relevant to their teaching irrespective of what discipline they work in:

> So with most of the things you do, issues of energy conservation and efficiency and therefore the whole broad issues of sustainability crop up (lecturer in engineering).
> On the surface you would think, occupational therapy is about recruiting people for the health profession, primarily; what has that to do with sustainable development? And yet if you look at … all the resources that are required to get them qualified, it does have an impact on sustainability (lecturer in health).
> It does fit in the history of the EU stuff that I teach so I will probably expand it there a little bit (lecturer in humanities).

This research on sustainability suggests that there is potential for its inclusion in all curriculum areas – but only if lecturers can be persuaded that it is important to do so! To some degree, this provides a specific example of a more general rule which is that a lecturer's prior knowledge and beliefs about a subject influence the way in which the subject is presented to students (Prosser and Trigwell, 1999).

---

often linked with the potentially controversial nature of environmental or sustainability issues. However, research on how to teach controversial issues reveals a far from straightforward situation. It has long been assumed that a neutral or balanced perspective is required to avoid indoctrination of vulnerable students, and this belief is still held by many teachers in secondary and tertiary education. For example, research in England (Oulton et al, 2004, p415) suggests that school teachers identify three underpinning beliefs about teaching controversial issues. These are:

- a focus on rationality, reasoning and sticking to the facts;
- presenting a balanced view;
- teacher neutrality.

All three of these underpinning beliefs, however, are problematic if investigated further. For example, the facts relating to sustainability may be less than clear and depend significantly on the values of the individual describing them. An understanding of the transitory nature of facts, of knowledge and of what can be known undermines this position particularly strongly in the research-led environment of HE. Moreover, the notions of maintaining neutrality and balance may be constrained by a number of practical limitations including: premature consensus, entrenched positions or apathy on the part of students involved in discussion; inadvertent projection of the teachers' views while attempting to convey a neutral position (see Box 3.2 on the hidden curriculum); and reduction of complex arguments to dichotomies and polarized positions in an effort to provide balance.

Oulton et al (2004) offer a range of possible suggestions for the tutor, including:

- helping students to distinguish between sound and unsound reasoning, developing a respect for evidence and open-mindedness;
- being open about the fact that true balance is an unachievable goal, but helping students develop 'a critical awareness of bias and make this one of the central learning objectives' (p 417);
- declaring their own position explicitly so that students can be aware of potential bias in the teaching.

These approaches potentially offer an attractive proposition for higher education across the disciplines, drawing as they do on notions of logic, reasoning and criticality. Alongside an attempt to incorporate sustainability content into the curriculum, it is perhaps helpful to think in terms of developing the knowledge and skills of sustainability literacy – these would include open-mindedness and critical awareness of bias. A set of key questions might help to scaffold students' critical thinking skills in terms of issues such as:

- Where did this information or view come from?
- Who provided it?
- How are they funded?
- Whose interests do they represent?
- What values are they expressing (explicitly or covertly)?
- What evidence do they present?
- Do they evaluate it?

These questions could be utilized in a range of different contexts to explore the basis of decision-making, including decisions on sustainability issues, as appropriate. In this way, ESD is viewed as a different lens through which to view the discipline that focuses on the implications for economy, environment and society, rather than an imposed set of constructs and beliefs.

Box 3.2 The hidden curriculum

Aside from overt impacts on students' views of sustainability, which might be attributed to curriculum and pedagogy, it is clear that students will also be affected by what is known as 'the hidden curriculum' (Jackson, 1968, pp10–33). This incorporates the messages sent by an individual tutor or an institution to students, often unconsciously and covertly, about how they ought to think and behave. A key way in which the hidden curriculum is made manifest is through the ethos and values of the institution. These might be illustrated by the extent of recycling facility provision and green travel plans, or by student engagement in decision-making and democratic processes. There is also potential, the Plymouth research suggests, for individual lecturers' personal beliefs to influence both the content and structure of the curriculum:

> As lecturers we have viewpoints that we share with our students in many ways, probably more complexly than just teaching about it. Very simple comments that you slip in, in a lecture, about saving trees for instance ... I think that tutors actually influence students in ways well beyond the classroom or the subject ... by choosing texts and cultural products which, while possibly commenting on their structure or contextualization, also provide pawns for discussing issues of sustainability, which is actually what people do all the time (lecturer in art).

This lecturer suggests that comments in a lecture or use of resources may send messages about the tutor's underlying values. A surprising finding of our research on ESD in HE was the extent to which lecturers talked about sustainability 'creeping' into the curriculum through informal or subconscious means such as this (Cotton et al, 2009). Research in schools also indicates that it is extremely difficult to maintain a neutral position when teaching about controversial issues such as those pertaining to sustainability. A detailed analysis of classroom discussions on environmental topics reveals that the teacher's viewpoint was expressed covertly (and often unintentionally) via control of participants' turns in discussion and use of rhetorical questions to indicate disagreement (Cotton, 2006).

While it is impossible to avoid such unconscious messages to students, a critical awareness of the different ways in which the hidden curriculum might be at work both within and beyond the classroom is essential to understanding the impact of teaching about sustainability. Encouraging student participation in classes, and in making decisions on assessment and other academic issues, is one way in which lecturers can model good practice to set the tone for sustainability in higher education.

What kinds of teaching methods have been advocated for sustainability?

The literature includes a wide range of suggestions for appropriate approaches to teaching about sustainability and also for specific teaching methods. Underlying many of these approaches is support for active, experiential learning, interdiscipli-

narity and use of the local (and regional) environment for educational purposes. Potential learning approaches are *participative inquiry/action research*, where students investigate an issue which is of importance to them personally (Tilbury, 2007); *transformative sustainability learning* (TSL), where tutors attempt to use the three domains of learning – cognitive, psychomotor and affective, or head, hands and heart as they have been described – to engage students in a transformative educational experience (Sipos et al, 2008); and *action competence*, where students are encouraged to envisage alternatives and solutions to unsustainable practices (Breiting and Mogensen, 1999).

Specific teaching strategies advocated for environmental education or ESD include those listed below (examples of how some of these are used in practice are given in Box 3.3). It is likely that utilizing a range of these strategies would be most appropriate.

Role-plays and simulations

Role-plays have long been recommended for teaching about environmental issues and sustainability, although there is a surprising lack of evidence in terms of effective outcomes (Oulton et al, 2004). Potential advantages of role-plays are that they provide an opportunity for students to gain an in-depth understanding of another person's perspective and to empathize with others; disadvantages are the amount of time and organization required to enable effective role-playing and the difficulties of managing the role-play, particularly with large groups. Role-plays are used rarely in university education, possibly because of the practical difficulties or because the pedagogy is poorly aligned with the learning culture of HE.

Group discussions

Group discussions were frequently mentioned by both school teachers and lecturers when asked to describe an appropriate pedagogy for sustainability (Cotton, 2006; Cotton et al, 2007). The use of a discussion may be an attempt to counteract the risk of the tutor taking a transmissive or authoritarian approach, thereby enabling students to discuss their own and others' views. Discussions potentially enable a range of perspectives to be aired, but they may be confrontational and prove difficult to control, especially if the topic is a controversial one. The tutor needs to be able to encourage listening and self-reflection rather than argument and should be clear about their own role in the discussion (see Box 3.2 for some of the difficulties of neutrality as a tutor position). Structured questions to scaffold students' learning may be helpful, as may explicit meta-cognitive instructions as to the purpose of the discussion and the rules of engagement. Without such guidance, many students – accustomed to the transmissive nature of much of their educational experience – may be uncertain how to respond.

Stimulus activities

A stimulus activity might involve watching a video or looking at photos, poems or newspaper extracts to initiate reflection or discussion (Oulton et al, 2004). Students may even be involved in producing their own work such as photos taken

around the campus to stimulate a discussion on campus greening. Use of videos or externally-produced documents potentially enables the tutor to bring in a wide range of viewpoints for critical analysis, and this approach is feasible even with very large groups.

Debates

Debates in which two groups of students put forward opposing arguments on an issue are often recommended as a method of teaching about sustainability since they encourage students to gather information about the topic and develop an argument. However, they can become confrontational and students may be discouraged from engaging or empathizing with others' views. Authors such as Oulton et al specifically warn against asking students to vote on an issue as this may lead to them making up their minds too soon, hardening their attitudes and leaving them feeling committed to the stance that they have taken (Oulton et al, 2004).

Critical incidents

The use of critical incidents to teach about sustainability is described in a paper by Nott and Wellington. Students are given an example and asked what they would do, what they could do and what they should do (Nott and Wellington, 1995). This allows them to consider their personal perspectives and actions in the light of a moral or ethical stance. The approach can also be used with groups to promote awareness about multiple perspectives on sustainability.

Case studies

Another popular choice of pedagogy for teaching about sustainability described by lecturers in our research was the case study approach. Tutors described using case studies to bring ESD into areas of the curriculum that had not traditionally involved a clear focus on sustainability (Cotton et al, 2009), and to provide students with an holistic view of an issue. Case studies enable students to investigate issues that affect their local area, to work with private enterprises and community groups and to work together in finding solutions to local issues. They may take a variety of forms, but one possible approach is to place strong emphasis on 'reflection, research, participation and action' (Junyent and de Ciurana, 2008, p769).

Reflexive accounts

Considering their own position in relation to new knowledge about sustainability can help students understand how individual actions contribute to sustainability. Although contentious in HE (Knight, 2005), behaviour change is a cross-cutting priority of the UK sustainable development strategy (DEFRA, 2005) and education is identified as a core vehicle for achieving this. Therefore, pedagogies that provide opportunities for students to reflect on personal roles, attitudes and responsibilities in relation to a range of sustainability issues are potentially advantageous.

Personal development planning (PDP)
PDP has been embedded in UK HE since 2000 (Quality Assurance Agency for Higher Education [QAA], 2000). 'PDP is a structured and supported process undertaken by a learner to reflect upon their own learning, performance and/or achievement and to plan for their personal, educational and career development. It is an inclusive process, open to all learners, in all HE provision settings, and at all levels' (QAA, 2009, p3). PDP can provide an opportunity for students to learn about and reflect on sustainability (John Forster Associates, 2006). Sustainability literacy may be a set of skills, development of which is encouraged throughout the student experience of HE and recorded through the PDP process. Students may also be able to integrate relevant informal learning activities and volunteering into the PDP record.

Critical reading and writing
Reading and writing are often downplayed in favour of more interactive pedagogies. However, these are important social practices and the key to progressing sustainability and literacy. Stibbe suggests students can gain from deconstructing destructive, alternative or counter-discourses to identify the possible motivation of the author. They may also be able to envisage alternative futures, and write a contrasting account based on a differing set of values (Stibbe, 2008).

Problem-based learning
Problem-based learning is an iterative learning process that can be used to teach a whole range of subject matter. In the context of ESD, a sustainability-related issue may be identified and students asked to research this to generate a body of knowledge. They can then develop a vision of alternative actions and potential solutions to the problem, which they use to devise a plan of action. The action may then be carried out, followed by a period of reflection and evaluation. This process can be extremely useful because it promotes both the conceptual and practical aspects of sustainability literacy. Brunetti et al (2003) describe a specific example of the use of problem-based learning to teach about social, economic and environmental sustainability issues.

Fieldwork
Fieldwork is an example of experiential pedagogy that can influence students' emotions (Sivek, 2002) and help develop the critical thinking skills so essential to understanding the complexity of sustainability (Jones, 2003; Scott and Gough, 2003). Fieldwork for sustainability can be based on issues in the local community and environs, linking theory to real-world examples (Hope, 2009), which can help students to understand multiple stakeholder perspectives in situ. There is also evidence that outdoor experience is an important precursor to understanding sustainability (Palmer and Suggate, 1996) and that fieldwork promotes broader benefits for learning by encouraging active and reflective learning among students (Hope, 2009).

Box 3.3 Examples of sustainability pedagogies in practice

Role plays

> Through role-playing is the way forward. I often ask the room if any of them have a feeling on this ... and then I'll flip their role. So for the ones who say I don't think fishing should kill dolphins, I'll make them research on the side of the fishermen. So instead of leaving them with their preconceived idea, stick them in the other one. So I say, "Right, you guys are going to be the environmental lobby, you'll be the industry lobby and in both cases one will lead and the other will defend." So when the conservationists are leading, the industry will defend, and [the others] will be the audience. And at the end of that discussion, see which one they think is going to get the public's vote (lecturer in marine science).

Discussions

> I feel in some ways education should equip young people to be able to make up their own minds about their futures... I think there is an interesting thing about how we view excess at the moment, which is worth having a discussion with students about. In some ways I think they get mixed messages; on the one hand, I think they get the kind of Pepsi Max society – it's all possible. There is this sort of idea of choice; and on the other hand, they possibly run into some surprising constraints if they choose to do some other things ... that's why I think we need to keep an impartial position (lecturer in media).

Stimulus activities

> I do encourage critical thinking. So I will present an article to the student. This is a very old article from the Ecologist on recycling and reuse, which you can tell is something I feel very strongly about. I think anybody who really thinks for two minutes about recycling has to ask questions. I think the more in favour of recycling you are the more questions are going to come up. So I would use this article with them, which does have questions of sustainability in it, because ultimately it is promoting a culture of durability, as opposed to a culture of throughput and reprocessing. It's obviously not my remit to actually teach sustainability. But I prefer to use texts with some kind of ethical value (lecturer in business).

Case studies

> We are doing some teaching on a project called Ecohouse looking at ecological development... It is like a design project where students are given a plot and design buildings on that site and look at things such as energy use and their aim is to build something that is sustainable. The site is near the railway and in an area that has social problems and it's interesting to see the students take on things and not just looking at the environmental issues (lecturer in engineering).

Modelling good practice

> I think at a personal level there is a huge amount we can do, and I've always felt that in the position where you have a teacher and students ... you set an example, it's not just what you say, it's what you are. And if you stand up in front of a group of students and say you should be going by public transport and every evening you go out to your car and drive home... Students are very perceptive, and they understand this (lecturer in health).

Modelling good practice

Despite the focus here on teaching strategies, the importance of learning taking place implicitly through the hidden curriculum (see Box 3.2) and outside the classroom should not be underestimated. In our research, many lecturers talked of reducing paper (by provision of online resources, for example) and turning lights out at the end of a teaching session, and it is clear that students will react cynically to any indication that the lecturers' expressed views conflict with their own behaviour. Moreover, the role of higher education as a transformative experience could, and perhaps *should*, go well beyond turning off lights and providing recycling facilities:

> *Social education for me is a big part of the university. It is not just coming out with a degree, it is how you change and what your values are when you finish. I think there is so much to sustainable development for me in the University of Plymouth that is not just about bits of paper and light bulbs (lecturer in health).*

Potential for future development of sustainability pedagogies in HE

Looking at the pedagogies advocated above, it is immediately obvious that many of these approaches require a significant amount of prior preparation, as well as small groups and a reasonable time allocation. The barriers to engaging in such teaching approaches in the constraints of the current HE system should not be underestimated.

However, it is also clear that if students are to be given the opportunity to reflect seriously on sustainability issues, time needs to be made available within the curriculum for serious exploration and discussion. To provide a successful learning environment that encompasses sustainability, both students and lecturers should feel free to express their views in a supportive environment, but one where self-reflection and change of viewpoint is encouraged. As a general rule, students should be encouraged to evaluate critically any information provided, to identify potential sources of bias and to reflect on their own views and prejudices to help them make decisions about complex issues both within and beyond the sustainability debate.

If the use of sustainability pedagogies is to become more widespread, then those lecturers who are already committed to sustainability principles will need support and resources to enable them to develop their teaching along these lines. For those who are yet to be convinced, an understanding of the potential of sustainability pedagogies to form part of a wider move towards student-centred, active learning approaches may act as an incentive.

Pedagogies that help students develop critical thinking skills also provide an important contribution to the wider skills sector. The link between skills for sustainable development and the needs of the economy to provide a sustainable

future has only recently been made (DfES, 2003); however, skills for sustainable development are fast becoming viewed as a 'vital national asset' (DfES, 2003, p8) with the potential to enhance social mobility and tackle exclusion as well as achieve economic objectives. Although this may be more easily accommodated in vocational degrees, the profile of employability skills continues to rise throughout academia and may provide a useful framework for including sustainability literacy in subjects where its relevance is not clear-cut. In all cases, there is an undoubted need for professional development to embed, value and reward good (sustainability) pedagogic practice and to enable lecturers to engage with new ways of thinking about teaching and learning in HE.

A further requirement is what has been described as 'space for pedagogical transformation' – the creation of 'spaces on campus where transformative and transdisciplinary learning is supported and encouraged' (Moore, 2005, p337). This should include physical space to support the development of more student-centred, collaborative (and interdisciplinary) approaches, a space where reflection can take place, and where project or action planning can occur. It should be innovative, exciting, technology-rich and, crucially, flexible in terms of lighting, seating and presentation areas to encourage lecturers to consider variation in modes of working and interacting with students – in contrast to the formal teacher-focused pedagogy which is encouraged by the traditional stepped lecture theatre.

E-learning contexts can also provide a space for sustainability-related learning to occur. Online forums can provide a suitable environment for constructing discussions and debates and enable participants to cross disciplinary boundaries by offering a neutral space for students and staff from different subject areas. Online modules about sustainability can be used as an aid by lecturers with little experience of sustainable development.

The perception of students as consumers, together with the marketization of HE, has further consequences for sustainability. Students may be reticent to sign up to courses that feature sustainability, not viewing it as applicable to their personal or career trajectories. If the sustainability of teaching methods is considered in its broadest sense then key selling points for courses such as foreign field trips would need to be reconsidered, which may have adverse impacts on course recruitment. A lecturer in our Plymouth study, for instance, noted the reluctance of students to become involved in sustainability activities, despite their underlying concerns:

> *I've spoken to a lot of students at a personal level about what they feel about sustainability, and I believe many are extremely concerned about the situation that they perceive we're in and would like to do something if they felt it was going to be worth their while. So while there's a reluctance perhaps at the moment to commit themselves, I think if they could see why something was being put forward or suggested, then I believe they would become involved (lecturer in health).*

However, Sterling and Scott (2007) identify ways in which student demand can put pressure on academics to include sustainability in their courses, and the HEFCE's 2008 review notes that 'There is a clear niche in the academic market-place for institutions that wish to champion sustainability ...' (p35). In this way, pressure from both staff and students may combine to move this agenda forward.

References

Biggs, J. (1999) *Teaching for Quality Learning at University*, Society for Research in Higher Education and Open University Press, Buckingham

Breiting, S. and Mogensen, F. (1999) 'Action competence and environmental education', *Cambridge Journal of Education*, vol 29, no 3, pp349–353

Brunetti, A.J., Petrell, R.J. and Sawada, B. (2003) 'SEEDing sustainability: Team project-based learning enhances awareness of sustainability at the University of British Columbia, Canada', *International Journal of Sustainability in Higher Education*, vol 4, no 3, pp210–217

Cotton, D.R.E. (2006) 'Teaching controversial environmental issues: Neutrality and balance in the reality of the classroom', *Educational Research*, vol 48, no 2, pp223–241

Cotton, D.R.E., Warren, M.F, Maiboroda, O. and Bailey, I. (2007) 'Sustainable development, higher education and pedagogy: A study of lecturers' beliefs and attitudes', *Environmental Education Research*, vol 13, no 5, pp579–597

Cotton, D., Bailey, I., Warren, M. and Bissell, S. (2009) 'Revolutions and second-best solutions: Education for sustainable development in higher education', *Studies in Higher Education*, vol 34, no 7

Dawe, G., Jucker, R. and Martin, S. (2005) *Sustainable Development in Higher Education: Current Practice and Future Developments*, HEA, York www.heacademy.ac.uk/assets/York/documents/ourwork/tla/sustainability/sustdevinHEfinalreport.pdf Accessed 6 March 2009

DEFRA (2005) *Securing the Future: The UK Government Sustainable Development Strategy*, The Stationery Office, London, available at www.defra.gov.uk/sustainable/government/publications/uk-strategy/documents/SecFut_complete.pdf, accessed 6 March 2009

DfES (2003) *White Paper Twenty-First Century Skills: Realising Our Potential. Individuals, Employers, Nation*, HM Treasury: Department of Trade and Industry, London

DfES (2006) *Sustainable Schools for Pupils, Communities and the Environment: Government Response to the Consultation on the Sustainable Schools Strategy*, available at http://publications.teachernet.gov.uk/default.aspx?PageFunction=productdetails&PageMode=publications&ProductId=DFES-04294-2006, accessed 6 March 2009

Fien, J. (2006) *Education for Sustainable Development: A Perspective for Schools*, Raja Roy Singh Lecture, 10th Asian Programme of Educational Innovation for Development International Conference, Bangkok, Thailand, 6–8 December 2006, available at www.unescobkk.org/education/apeid/apeid-international-conference/10-th-apeid-international-conference/speakers-and-speeches/john-fien/raja-roy-singh-lecture/, accessed 23 June 2009

Haigh, M. (2005) 'Greening the university curriculum: Appraising an international movement', *Journal of Geography in Higher Education*, vol 29, no 1, pp31–48

HEFCE (2005) *Sustainable Development in Higher Education: Strategic Statement and Action Plan*, HEFCE, Bristol

HEFCE (2008) *Strategic Review of Sustainable Development in Higher Education in England*, HEFCE, Bristol, available at www.hefce.ac.uk/pubs/rdreports/2008/rd03_08, accessed 6 March 2009

HEFCE (2009) *Sustainable Development in Higher Education: 2008 Update to Strategic Statement and Action Plan*, HEFCE, Bristol, available at www.hefce.ac.uk/pubs/hefce/2009/09_03/09_03.pdf, accessed 3 February 2010

Heinz Family Foundation (1995) *Blueprint for a Green Campus: The Campus Earth Summit Initiatives for Higher Education*, Pittsburgh PA

Hope, M. (2009) 'The importance of direct experience: A philosophical defense of fieldwork in human geography', *Journal of Geography in Higher Education*, vol 33, no 2, pp169–182

Jackson, P.W. (1968) *Life in Classrooms*, Holt, Rinehart and Winston, New York NY

John Forster Associates (2006) *Embedding Sustainability into the Curriculum of Scotland's Universities and Colleges*, available at www.sfc.ac.uk/reports_publications/reports_publications.aspx?Search=john%20forster&Type=Reports%20and%20publications&Sector=-1, accessed 22 February 2010

Jones, V. (2003) *Young People and the Circulation of Academic Knowledges*, Department of Geography, University of Aberystwyth

Junyent, M. and de Ciurana, A.M.G (2008) 'Education for sustainability in university studies: A model for reorienting the curriculum', *British Educational Research Journal*, vol 34, no 6, pp763–782

Knight, P. (2005) 'Unsustainable developments', *The Guardian*, 8 February, available at www.guardian.co.uk/education/2005/feb/08/highereducation.administration, accessed 6 March 2009

Moore, J. (2005) 'Seven recommendations for creating sustainability education at the university level: A guide for change agents', *International Journal of Sustainability in Higher Education*, vol 6, no 4, pp326–339

Nott, M. and Wellington, J. (1995) 'Critical incidents in the science classroom and the nature of science', *School Science Review*, vol 76, no 276, pp41–46

Oulton, C., Dillon, J. and Grace, M. (2004) 'Reconceptualising the teaching of controversial issues', *International Journal of Science Education*, vol 26, no 4, pp411–423

Palmer, J. and Neal, P. (1994) *The Handbook of Environmental Education*, Routledge, London

Palmer, J. and Suggate, J. (1996) 'Influences and experiences affecting pro-environmental behaviour of educators', *Environmental Education Research*, vol 2, no 1, pp109–121

Prosser, M. and Trigwell, K. (1999) *Understanding Learning and Teaching: The Experience in Higher Education*, The Society for Research into Higher Education and Open University Press, Buckingham

QAA (2000) *Policy Statement on a Progress File for Higher Education*, available at www.qaa.ac.uk/academicinfrastructure/progressFiles/archive/policystatement/default.asp, accessed 23 June 2009

QAA (2009) *Policy Development Planning: Guidance for Institutional Policy and Practice in Higher Education*, available at www.qaa.ac.uk/academicinfrastructure/progressfiles/guidelines/pdp/pdpguide.pdf, accessed 23 June 2009

Rasmussen, H. (2008) *The Earth Charter and the Educative Principles of Sustainability*, Earth Charter International, available at www.cartadellaterra.org/media/File/PROGETTI_E_PERCORSI/terra%20che%20cura/intervento%20henriette.pdf.pdf, accessed 23 June 2009

Scott, W. and Gough, S. (2003) *Sustainable Development and Learning: Framing the Issues*, Routledge, London

Sipos, Y., Battisti, B. and Grimm, K. (2008) 'Achieving transformative sustainability learning: Engaging head, hands and heart', *International Journal of Sustainability in Higher Education*, vol 9, no 1, pp68–86

Sivek, D.J. (2002) 'Environmental sensitivity among Wisconsin high school students', *Environmental Education Research*, vol 8, no 2, pp155–170

SQW Ltd (2006) *Specialist Review and Evaluation of the Higher Education Partnership for Sustainability (HEPS) Programme*, available at www.hefce.ac.uk/Pubs/rdreports/2006/rd08_06/, accessed 6 March 2009

Sterling, S. (2001) *Sustainable Education: Re-visioning Learning and Change*, Green Books, Dartington

Sterling, S. (2004) 'An analysis of the development of sustainability education internationally: Evolution, interpretation and transformative potential' in Blewitt, J.and Cullingford, C. (eds) *The Sustainability Curriculum: The Challenge of Higher Education*, Earthscan, London, pp43–62

Sterling, S. and Scott, W. (2007) England contribution, *First International Meeting on Implementation of Education for Sustainable Development for Higher Education Institutes*, 8–9 February 2007, Amsterdam, available at www.eauc.org.uk/first_international_meeting_on_implementation_of_e, accessed 10 March 2008

Stibbe, A. (2008) 'Words and worlds: New directions for sustainability literacy', *Language and Ecology*, vol 2, no 3, pp1–10

Tilbury, D. (2007) 'Monitoring and evaluation during the UN decade of education for sustainable development', *The Journal of Education for Sustainable Development*, vol 1, no 2, pp239–254

Van den Bor, W., Holen, P., Wals, A. and Filho, W. (2000) *Integrating Concepts of Sustainability into Education for Agriculture and Rural Development*, Peter Lang, Frankfurt

Chapter 4

Third-wave Sustainability in Higher Education: Some (Inter)national Trends and Developments

Arjen E.J.Wals and John Blewitt

Introduction

Conventional wisdom holds that all education is good, and the more of it one has, the better... The truth is that without significant precautions, [it] can equip people merely to be more effective vandals of the Earth (Orr, 2004, p6).

Sustainability is not just another issue to be added to an overcrowded curriculum, but a gateway to a different view of curriculum, of pedagogy, of organizational change, of policy and particularly of ethos. At the same time, the effect of patterns of unsustainability on our current and future prospects is so pressing that the response of higher education should not be predicated only on the 'integration of sustainability' into higher education, because this invites a limited, adaptive, response... We need to see the relationship the other way around – that is, the necessary transformation of higher education towards the integrative and more whole state implied by a systemic view of sustainability in education and society (Sterling, 2004, p50).

In this chapter, we will highlight what we call examples of 'third-wave' sustainability in higher education from outside the UK.[1] Third-wave sustainability in HE