

Planet

Education for Sustainable Development (ESD): Ideas for learning and teaching in Geography, Earth and Environmental Sciences

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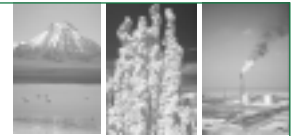
What is PLANET?

PLANET is the bi-annual publication of the LTSN Subject Centre for Geography, Earth and Environmental Sciences.

Its aims are to:

- Identify and disseminate good practice in learning and teaching across the three disciplines of Geography, Earth and Environmental Sciences and present examples and case studies in a "magazine" format.
- Provide a forum for the discussion of ideas about learning and teaching in the three discipline communities.
- Provide information for readers on Subject Centre activities and on related resources, conferences and educational developments.

Front Cover Photograph Acknowledgements



Left - Photo by John Simmons
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Volcano overlooking hypersaline lagoons in which flamingoes are feeding - Atacama Desert, Chile

Middle - Photo by Ted Nield
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Tufaceous chimneys, Mono Lake, California, USA. The tufa formed around hot springs on the lake bed and have been exposed by subsequent lowering of the lake by water extraction. Such columns are characterised by an unusual form of hydrated calcium carbonate known as lkaite. Field of view c. 1.5 metres tall

Right - Photo by John Simmons
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A happily rare site in today's cleaner oil industry - flaring gas at an oil production installation, Egypt

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Introduction

Setting the Sustainability Scene

Brian Chalkley, LTSN-GEES

It is now more than ten years since 180 governments at the Rio de Janeiro Earth Summit committed themselves to the quest for sustainable development. The Rio Summit built on the pioneering work of the United Nations 1987 Brundtland Report which defined sustainable development as 'development which meet the needs of the present without compromising the ability of future generations to meet their own needs'.

Since then there has been an increased understanding of the social and economic dimensions of sustainability as well as its environmental basis. Since then also, governments around the world have produced rafts of sustainability strategies and programmes. Sadly, of course, the rhetoric has all too often not been matched by the reality of policy implementation. There have been some successes, but overall on the major global issues such as climate change, bio-diversity, environmental degradation, hunger and poverty, the pace of progress has been disappointingly slow.

The Rio Summit, through Agenda 21, identified a wide range of strategies for achieving sustainability, one of the key policy areas, of course, being education. National governments were expected to review and enhance their provision for environmental education at all levels from primary to tertiary. Education was seen as a means of raising environmental awareness not only across the public at large but in time also among key government and business decision-makers.

Here in the UK there has been a range of initiatives intended to give environmental education and, in particular sustainable development, a higher profile. In the schools sector, for example, the new 'citizenship' curriculum ensures that all secondary pupils have at least some familiarity with the basic principles of sustainable development and in recent years it has also featured more prominently in the geography curriculum. However, although geography is widely acknowledged as the main school discipline for the teaching of sustainable development, unfortunately geography's role in the national curriculum has been contracting. Moreover, compared with issues such as literacy, numeracy and IT, education for sustainability appears to occupy a somewhat peripheral position on the government's education map.

Within higher education, although there are now a few degree programmes with sustainability in the title, the main torch-bearers continue, of course, to be the three 'GEES' disciplines, namely, Geography, Earth and Environmental Sciences. Individual degree programmes vary considerably in their coverage of sustainability issues but, in line with the Quality Assurance Agencies' Benchmark statements, it is likely that sustainability features in the curriculum of all UK GEES undergraduate degrees. In addition, it will no doubt play at least a small role in many courses in areas such as civil engineering, architecture, economics and tourism. However, the great majority of UK students will not encounter sustainability anywhere in their degree programmes. And this is despite a decade of initiatives and projects intended to 'green' higher education curricula. It is now ten years since the first Toyne Report (1993) recommended that all higher and further education institutions should prepare environmental policy statements. However, although some progress has been made in areas such as campus management and energy efficiency the goal of integrating sustainability across the HE curriculum has remained largely elusive.

Despite the limited progress to date, the government's Sustainable Development Education Panel (established in 1998) remains committed to the goal of all HE students having sustainable development learning opportunities. This is in part for citizenship reasons but also because in many public, private and voluntary sector organisations, employers are now looking for graduates who can help them adapt their policies and practices to meet sustainable development objectives. In pursuit of this agenda, Universities UK (UUK) and the Standing Conference of Principals (SCOP) have recently set up a new group for sustainability in higher

education chaired by Michael Driscoll, the Vice Chancellor of Middlesex University.

The publication of this theme issue of PLANET is therefore particularly timely. Here in the UK, as explained, we have a new HE policy group on sustainability. And internationally at the recent Johannesburg Earth Summit 2002 (whatever its other failings) the participating governments committed themselves to 'integrate sustainable development into education systems at all levels, in order to promote education as a key agent for change'.

The aim of this special issue of PLANET is, therefore, to raise awareness, amongst GEES academics and others, of a number of initiatives and developments in the field of education for sustainability. Given that sustainable development is very much an international issue, we are delighted that several of the papers are from overseas. Indeed, the idea for this theme issue stemmed from a symposium held in Moscow in June 2002, where a number of leading Russian and UK specialists came together to exchange ideas and good practice. This symposium, part-funded by our LTSN-GEES Subject Centre, was hosted by the Faculty of Geography at Moscow State University. Shortened versions of several of the Moscow papers are included in this theme issue, together with other papers designed to inject additional ideas and alternative perspectives.

Our first main article by Ros Wade focuses on relevant curriculum developments at the schools level. In outlining the position of education for sustainability in UK secondary education, the paper provides an understanding of the platform on which higher education can build. The next two articles, by William Scott and Stephen Gough, and by Peter Higgins and Gordon Kirk, also link the secondary and tertiary levels. They focus on the key issue of how teacher training courses can better equip new teachers to engage with education for sustainability.

The next three articles, by William Scott et al., by Shirley Ali Khan and by Andy Johnston and Heloise Buckland, all address the issue of greening the Higher Education curriculum. Taken together they review the initiatives undertaken since Rio, identify the major challenges which still remain to be effectively addressed and outline the work of a major programme currently in progress, namely the Higher Education Partnership for Sustainability (HEPS).

The next two articles give examples of UK courses in education for sustainability. Dave Eastwood outlines a new PgDip/MSc course delivered by web-based distance learning. And Steve Martin describes a short course in sustainability for professionals working in the world of business, government or voluntary organisations. Then our last UK author, Martin Haigh, highlights the educational value of practical environmental projects, such as those undertaken by non-government organisations (NGOs).

The final set of papers remind us of the importance of thinking internationally and learning from practice overseas. Nikolai Kasimov and colleagues provide an introduction to education for sustainability in Russian Universities. This gives the context for three Russian case studies by Sergey Bobylev, by Vladimir Tikunov and by A. Kapitzka et al. which offer accounts of courses currently being delivered in Moscow. And finally, Kaisu Sammalisto describes the progress of greening the HE curriculum in Sweden and Roy Jones takes us to the antipodes for insights into education for sustainability in Australia.

Although this theme issue of PLANET clearly covers a lot of ground, it makes no claim to be comprehensive. We hope none the less that it will raise awareness of sustainability education and invite our readers to re-think their own attitudes and approaches to this key issue. We hope also that it may help encourage the Learning and Teaching Support Network (LTSN) as a whole to consider its own position vis-à-vis the sustainability agenda. This is clearly a subject where our own Subject Centre, LTSN-GEES, has a leading role to play but greening the HE curriculum as a whole will demand a broader and properly co-ordinated approach. This is an agenda where the LTSN, with its links to all the HE disciplines, could perhaps be well positioned to make a difference.

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Sustainable development education and Curriculum 2000

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This article was first published by the Geographical Association (GA) as: Wade, R. (2002) 'Sustainable development education and Curriculum 2000', *Teaching Geography*, 27 (3), 108-111. The article draws on papers presented at the Geography Association Annual Conference in April 2000, and at the Preparation for Adult Life conference at Goldsmiths College Centre for Cross Curricular Initiatives in 1999.

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Abstract

In this article, Ros Wade shows how geography teachers can play a role in education for sustainable development (ESD). The article makes reference to Curriculum 2000; a UK government initiative aimed at promoting breadth whilst still maintaining some specialisation in the 16-19 curriculum. The paper provides some thought-provoking and interesting ideas about sustainable development education at the pre-tertiary level and will no doubt be of interest to GEES academics wanting to know more about ESD in the school curriculum.

Introduction

According to a Council for Environmental Education (CEE) report to the Department for Education and Employment and the Qualifications and Curriculum Authority, sustainable development education (SDE) is concerned with:

'the learning needed to maintain and improve our quality of life and the quality of life of generations to come. It is about equipping individuals, communities, groups, businesses and governments to live and act sustainably; as well as giving them an understanding of the environmental, social and economic issues involved. It is about preparing for the world in which we will live in the next century and making sure that we are not found wanting' (CEE, 1998, p. 30).

The term 'sustainable development' has its origins in the Brundtland Report (WCED, 1987) and Agenda 21 (UNCED, 1992). The plan 'Blueprint for Action: Agenda 21' resulted from Earth Summit of 1992 at which all the world's leaders signed up to a range of commitments on sustainable development. The definition in the Brundtland Report is probably the most widely used; 'development which meets the needs of the present without compromising the ability of future generations to meet their own needs' (WCED, 1987). However, the term is not unproblematic and there is a danger that it can be seen 'like Mom and Apple Pie [as] an incontrovertibly Good Thing and has an ability to mean all things to all people' (Killeen, 1995). For example, 'neo Liberal' economists maintain that market-led growth and the development of new technology will resolve environmental problems while, at the other extreme, 'deep green' ecologists maintain that economic growth is the problem and that we need to perceive nature as being of the same importance as human beings. UNESCO described it as 'an emerging concept' in which we can all play our part in shaping. There is no doubt that it is a contested term but there is also no doubt that there is a shared imperative to achieve it. To me, two factors are essential:

- People, equity and justice must be at the heart of any interpretation of sustainable development;
- It must apply to all of us, especially those of us in northern industrialised societies.

Why do we need SDE?

To quote Agenda 21:

'Humanity stands at a defining moment in history. We are confronted with a perpetuation of disparities between and within nations, a worsening of poverty, hunger, ill health and illiteracy, and the continuing deterioration of the ecosystems on which we depend for our well being' (UNCED, 1992, p. 47).

According to the 1996 UN Human Development Report:

- 1.3 billion people (one-fifth of the human race) live in absolute poverty, lacking access to basic necessities such as food and clean drinking water;
- Northern countries with 25% of the world's population consume 80% of the world's energy.

And according to Oxfam, 'If everyone on the planet were to achieve northern levels of consumption then two extra planet Earths would be needed' (Oxfam, 1995).

We have all read the forecasts about depletion of the ozone layer, about the effects of deforestation and about climate change. The human race is like someone living way beyond his/her means. For a while we can carry on kidding ourselves that everything is fine, but some day soon, unless we take action to change our circumstances, we will have a rude awakening. This does not necessarily mean a natural disaster. Some would even argue that this has happened already: a lack of sustainable development for all has been cited as one of the root causes of the atrocity of 11 September 2001. And this terrible tragedy has highlighted the need not just to tackle terrorism (which is a major impediment to sustainable development), but also to address the wider inequalities and injustices in the world which terrorism feeds on.

Agenda 21 showed that world leaders could be united about the nature of the problems. However, agreement over the solutions is another matter and so far many of Agenda 21's commitments have been left unfulfilled. In November 2001 the Kyoto Protocol was agreed by 180 countries, however, this was without the support of the world's major polluter: the USA. However, the second Earth Summit, recently held in Johannesburg in 2002, provided an opportunity to review progress and gave educators a chance to feed into the discussions.

What does Curriculum 2000 say about SDE?

Although SDE is not awarded as high a profile as Citizenship in Curriculum 2000, it is nonetheless an important element of both the personal, social and health education and Citizenship frameworks. For example, at key stage 1 (age 5-7) 'students should be taught what improves and harms their local, natural and built environment'; and, at key stage 2, (age 7-11) 'students should be taught that resources can be allocated in different ways and that these economic choices affect individuals, communities and sustainability of the environment' (DfEE/QCA, 1999a, p. 139). The key stage 3 (age 11-14) and 4 (age 14-16) programmes of study contain more explicit opportunities for SDE, for example, 'students should be taught the wider issues and challenges of global interdependence and responsibility including sustainable development and Local Agenda 21'. They also underline the importance of taking responsible action: 'students should negotiate, decide and take part responsibly in both school and community based activity' (DfEE/QCA, 1999b, p. 184).

SDE is now also clearly identified within the rationale for the national curriculum where it states that the school curriculum should:

'enable students to think creatively and critically, to solve problems and to make a difference for the better ... It should develop their awareness, understanding and respect for the environments in which they live and secure their commitment to sustainable development at a personal, local, national and global level' (DfEE/QCA, 1999b, p. 11).

This is reinforced in the statement of values at the end of the *National Curriculum Handbook* which states that 'we should accept our responsibility to maintain a sustainable environment for future generations' (DfEE/QCA, 1999b, p. 148). This underlines its importance as an overarching concept for the whole curriculum, and the whole school ethos.

More specifically, references to sustainable development in geography have been strengthened across all key stages. This places geography teachers in a very influential position, both within the classroom, but also within the school as a whole. Research by the National Foundation for Educational Research (NFER) on effective teaching of environmental education highlighted the fact that a crucial element in changing attitudes was 'the beliefs and practices of environmentally motivated teachers which are the most significant in prompting young people to take action' (Saunders *et al.*, 1995, p. 20). Further they found that 'the role of the geography department seemed key, with 'the constraints there having a significant effect on overall levels of students awareness' (Saunders *et al.*, 1995, p. 24). In other words, motivated and committed geography teachers can strongly influence the extent to which young people develop their own commitments to a more sustainable world. This has also been reinforced by the introductory rationale to the programme of study which talks of the importance of geography in inspiring students 'to think about their own place in the world, their values and their rights and responsibilities to other people and the environment' (DfEE/QCA, 1999b, p. 154). Of course, it is important that SDE is not confined to the geography classroom. As an overarching concept and imperative to action it must become part of our thinking at all levels, from home to school to public life. A further finding of the NFER research indicated that without a supportive school ethos, students were unlikely to change their attitudes or actions towards the environment. 'In other words, it is the culture that the school creates which has the strongest impact on the behaviour of young people' (Saunders *et al.*, 1995, p. 26). Specialist geography teachers are, however, perhaps uniquely placed in their potential to grasp key global issues, such as climate change, and to have an overview of the debates on possible solutions. As such, geographers are in a position to influence the school agenda, to promote cross curricular initiatives on sustainability issues, to offer in-service training to colleagues, and to advocate the need for SDE to be embedded within the school development plan.

How do we ensure that SDE is part of the school curriculum?

There is now clear commitment in the national curriculum rationale for developing whole school policy on SDE, as well as within the Citizenship and PSHE orders and this means that there has probably never been such an opportune time for teachers and schools to take this forward. In 1999, schools' minister Charles Clarke was quoted in the *Times Educational Supplement* as saying: 'Due to reduced prescription, there is ample opportunity for teachers to use a range of sustainable development issues and contexts to develop subject-related skills'. And David Blunkett praised primary schools for their success at integrating these topics into almost every subject, which is how he hoped the new framework would be implemented (*TES*, 25 June 1999). However, teachers are already overburdened by new government initiatives. There are also many contradictory government messages to teachers. Despite broad commitments to Citizenship and SDE, there has been much greater emphasis on league tables, testing and the literacy and numeracy hours. One could sometimes be forgiven for thinking that the present government's preoccupation with what can be measured indicates their understanding of what one of Oscar Wilde's characters called 'the price of everything and the value of nothing'.

SDE, of course, cannot just be the responsibility of educators. It has to be the responsibility of the whole community. But teachers are very concerned about the major issues facing us as we enter the twenty-first century and, as the NFER research demonstrated, geographers in particular are ideally placed to help students develop the knowledge, skills and values to address these issues.

What are schools doing already?

Many schools already deliver SDE although they may not actually be using the term. In Sutton and Croydon, for example, a number of schools have been working with Local Agenda 21 officers and Oxfam Education to develop projects on Fair Trade and sustainable water use. In Tower Hamlets the 'Global Footprints' project looks at how children can develop their knowledge and understanding of sustainability issues through numeracy and literacy initiatives and learn to take action to reduce the global footprint of their school. This has led to work on whole school ethos and participation, with several project schools setting up schools councils. These examples support the NFER findings about the importance of the school experience as a whole, including school policy documents and mission statements, what is on school noticeboards, and above all to attitudes of teachers and support staff. So, for example, the 'Developing Rights' project in Sheffield, which linked a strong commitment to an anti-bullying policy to conflict resolution on a national and global level, is also addressing SDE (Oxfam, 1998).

In 1997, Oxfam Education worked closely on a project with Goldsmith's Centre for Cross Curricular Initiatives to introduce SDE to novice teachers. The novice teachers devised projects in design technology, art, social science and drama. These explored a range of areas related to SDE, such as, appropriate technology, Fair Trade, sustainable tourism and conflict resolution. The projects were carried out in schools and the novice teachers were then able to reflect on them and adjust their practice accordingly. One of the key learning points for everyone involved in the project was the need for thinking and reflection time. This applied to students, novice teachers, initial teacher education (ITE) tutors and staff at Oxfam Education. What we are grappling with in SDE is not straightforward. There are no easy answers and the questions we need to ask ourselves reflect on our values and our present lifestyles.

This clearly has implications for ITE and for continuing professional development, as many teachers will look for training and support to develop their own perspectives and knowledge of SDE. The new Citizenship ITE courses offer an opportunity for commitment to sustainable development because surely it has to be an essential component of responsible citizenship. However, given current government priorities, many teachers may need to look for personal development in SDE outside their local education authority or government training, perhaps through undertaking distance learning courses.¹

What teaching resources are available for teachers in schools?

The following resources, some of which are available free of charge (see 'References and further reading'), although aimed at school teachers, may also be of interest to academics in the GEES disciplines:

- Oxfam's Curriculum for Global Citizenship (1997a) brings together environmental and development education into a model for SDE. It provides a framework across all the key stages, and includes suggestions for teachers and examples of good practice.²
- The Council for Environmental Education's Report to DfEE and QCA on Education for Sustainable Development in the Schools Sector offers suggested learning outcomes for each key stage.
- A free leaflet, which summarises some of the Report, is also available from the Council for Environmental Education.

In addition, there is a wide range of teaching materials available from organisations such as Oxfam Education, the Worldwide Fund for Nature (WWF). For example, *Citizenship for the Future* (Leat, 2000) and *The School is Us*, (Renton, 1999) (both available from WWF) offer practical ideas for SDE work with seven year olds and upwards. The primary school teaching pack *Thengapalli* (Oxfam, 1997b) looks at a project where villagers in India have revitalised their environment and achieved community renewal. Two issues of *Teaching Geography* (1996, 2001) have focused on teaching

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about sustainable development, citizenship and environmental issues. The Geographical Association has also published *Geography and the New Agenda* which focus on strategies and information for delivering SDE (Grimwade *et al.*, 2000).

How do we ensure empowerment?

Faced with the big questions it is easy sometimes for all of us to feel disempowered. We may understand how interdependent we are in today's world – how, for example, our demand for inexpensive Harry Potter merchandise can result in sweatshop labour in polluting factories in China – but, individually, we may feel unable to influence such trends. Global institutions of governance, e.g. the World Trade Organisation, the World Bank and the International Monetary Fund, have grown in power and influence without any parallel growth of instruments for global democracy, hence the importance of civil society and non-governmental organisations who are able to represent alternative positions on the world stage. It is heartening to learn that in the UK there are far more members of environmental organisations than there are members of political parties. Geography projects can offer ideal opportunities for both teachers and young people to explore issues together as a group and to develop ideas for action while Citizenship work can encourage schools to link projects with the local community. Using resources such as *Thengapalli* will help young people see that individuals and communities can take action and improve their lifestyles and living conditions. It is also good to remind ourselves that in the last 50 years, according to the 1996 UN Human Development Report: mortality rates of children have been cut in half, and the number of people with access to clean water has doubled.

In addition, the efforts of the Jubilee 2000 Movement, which campaigned for Third World debt to be 'written off', have resulted in a partial success; and we have also seen the influence of consumer power in ensuring the labelling of all genetically modified (GM) foods. The GM campaign illustrates how environmental and development issues can coalesce; such campaigns are concerned not only for the health of people and countryside in the UK, but also for the futures and livelihoods of farmers in countries such as India.

In teaching SDE, we educators are not on our own – we form part of a global movement that has its roots in Agenda 21. Educators all over the world are concerned about issues such as those outlined above as well as about outdated and inappropriate curricula. In Tanzania (ranked one of the poorest countries in the world), for example, the new Civics Curriculum includes environmental and citizenship education. All schools now have 'self-reliance' projects, which enable young people to play a part in supporting and developing their school. The teachers have to work with classes of 60 to 170 students in deteriorating school buildings, with inadequate pay and training, but the local community involvement is effective, and thus schools have been able to achieve a great deal. The Tanzanian model is perhaps one which educators in more affluent countries could learn from.

We all need to decide what kind of local and global future we want for ourselves and our future generations. We should consider what we would like future generations to be saying about the achievements of our time. If we cannot *imagine* a sustainable future then it is unlikely to be achieved.

I believe that we can and must all play our part in ensuring that SDE is at the heart of the curriculum. It is our chance to be part of the solution, not the problem. However, we must accept that there are no 'quick fixes' and no easy answers. Despite the limitations, I choose to be optimistic. I believe that Curriculum 2000 offers educators the scope and opportunity to engage students in these debates and to develop the knowledge, skills and attitudes to cope with the challenges to come. SDE can be motivational, can help develop a sense of responsibility, encourage participation and democratic action and develop critical analysis. If all this seems too idealistic, it is worth reminding ourselves of the words of

Oscar Wilde 'A map without utopia on it is not worth consulting'. As Curriculum 2000 has not provided us with such a map then we need to draw it for ourselves.

EndNotes

1. Many teachers find that the flexibility of distance learning enables them to develop their own thinking in SDE and apply it directly into the work they are doing in the classroom. It is available at South Bank University (www.sbu.ac.uk/fhss/eede) and the University of Bath (www.bath.ac.uk/education/ce/home.htm).
2. *A Curriculum for Global Citizenship* seeks to bring together the agenda for development and environmental education into a curriculum for global citizenship, linking the personal, the local, the national and global. In May 2002, a primary teachers' handbook will also be available, with practical class and school activities to support SDE.

References and further reading

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- UN (1996) *Human Development Report 1996* (Gland: UN)
- World Commission on Environment and Development (WCED) (1987) *Our Common Future (The Brundtland Report)* (Oxford: Oxford University Press)

Further Reading

The DEA/CEE have developed a website on the World Summit for Sustainable Development for teachers – see <http://www.wssd-education.org.uk>

DETR (1999) *First Report of the Sustainable Development Education Panel* (London: DETR)

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Griffin, D., Meadows, J., Norman, A., Rogers, M. and Wade, R. (2002) *Teaching for a Sustainable Future: Embedding SDE in the ITT curriculum*. Centre for Cross-curricular Initiatives, South Bank University. (This is suitable for those in the ITE sector.)

The QCA website on sustainable development education contains case study examples and ideas for teachers <http://www.qca.org.uk>

The UNED-UK offer a free e-mail newsletter, Sustain(Ed), for teachers and educators on the World Summit for Sustainable Development 2002. Contact: abirney@earthsummit2002.org

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Re-orienting Teacher Education to Address Sustainability: Reporting on a UNESCO Initiative

William Scott and Stephen Gough
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Abstract

This article describes a UNESCO (United Nations Educational, Scientific and Cultural Organisation) network set up to facilitate the way in which teachers are able to deliver sustainable development education. The article focuses on both the short- and long-term 'joined-up thinking' approach adopted by UNESCO to support the teaching of such important issues. The network itself is making use of the goals and descriptions of education in relation to sustainable development concepts across many countries, as used in Agenda 21, namely: improving basic education, re-orientating existing education and raising public awareness, understanding and training.

The Context

As we are all well aware, education, training, and public understanding of issues in relation to sustainable development have been recognised as major objectives of governments around the world since the Earth Summit in Rio de Janeiro in 1992. At the United Nations Commission on Sustainable Development meeting in New York, in 1998, representatives of country after country testified that education (especially school education) was critical for a sustainable future. However, frustration was also prevalent because few if any models for implementing education in relation to sustainable development are readily available, and ministries of education around the world remain in something of a quandary over how to begin – although the recent Moscow seminar showed, there are the beginnings of experience. Many would go further; however, seeing the need, not only to incorporate sustainable development issues within formal educational programmes and structures, but also to re-orientate those same structures in order to make such incorporation both more feasible and more effective.

The world has around 59 million teachers and experiences a 5-10% turnover each year. Retraining this number of teachers to address education for sustainable development would be an immense task. Against this background, UNESCO has identified teacher education institutions within higher education as key change agents in re-orienting education. In their own particular ways, depending on context, they create the teacher education curricula, train new teachers, provide professional development for practising teachers, consult with local schools, and often provide expert opinion to regional and national ministries of education, although of course their ability to do this varies across countries depending on how much

freedom, responsibility and trust they are granted by governments. However, because of this influence in curriculum design, implementation, and the policy setting of educational institutions, it is argued by many that staff in teacher education institutions are ideally placed to bring about change that will promote education in relation to sustainable development, both in their own institutions, and in schools and therefore also help bring about systematic, economically effective change.

The UNESCO Initiative

In order to explore such issues, UNESCO and York University in Toronto, Canada, have established the UNESCO-UNITWIN Chair; the purpose of which is to provide advice to UNESCO and teacher training institutions across the world on re-orienting teacher training to address sustainable development. To facilitate and accomplish this, the Chair has established an international network of teacher education institutions that are working collaboratively to identify various ways of achieving this goal. The Chair [Professor Charles Hopkins] has formed a network of around 35 teacher education institutions from diverse regions of the world which are experimenting and researching effective methods of addressing the re-orientation of education.

Based on practical experiences, the network will advise UNESCO on how best to bring about institutional change in teacher training within higher education. Findings will be shared with other nations, ministries, and institutions around the world by publishing key findings and research results. The Chair's role is to facilitate collaboration between researchers and educators within and between teacher training institutions in order to develop and promote locally relevant education in relation to sustainable development. The work plan of the Chair calls for both short-term and long-term objectives:

Short term:

To undertake, through an international network of teacher education institutions, research and experimentation on different approaches to re-orienting teacher education toward sustainability.

Long term:

To develop suggestions and guidelines for re-orienting teacher education and associated realms of pedagogy, curriculum, and evaluation.

There are two tiers based on institutional involvement. Tier 1 Institutions are teacher education institutions who want to pursue large-scale changes in their teacher education programs in order to address sustainability. Tier 2 Institutions comprise those many faculty members and administrators who are working alone within their institutions to incorporate sustainability themes and pedagogy. As institutions join the network and gain expertise, they will share their experience and skills with other institutions both within the network and beyond. When we met for the first time as a UNESCO network, we agreed that if we were to do this effectively, there was a need to use a common research framework, which will allow comparison of results. This was developed by the Project Reporting Group, with representation from Brazil, the UK, the West Indies and Zambia, and is being used across the network.

Some Conceptual Issues

For the purposes of the Chair and network, a common understanding of the concept of education in relation to sustainable development is needed. However, rather than spending scarce time and energy defining this anew, the network uses the goals and descriptions from Agenda 21, agreed and signed by 179 world leaders in 1992. These concepts have been further refined by a series of major UN conferences in the 1990s. Of course, such education initiatives always carry with them the caveat that they should be implemented in locally relevant and culturally appropriate fashions. This caveat increases chances of successful implementation of education programmes and decreases the likelihood of importing inappropriate ones.

P L A N E T

Chapter 36 of Agenda 21 outlines, but does not define, the role of education in relation to sustainable development. In doing this, it identifies three major thrusts:

- (1) improving basic education;
- (2) re-orienting existing education to address sustainable development, and
- (3) developing public understanding, awareness, and training.

These three thrusts, which have been re-confirmed at the World Summit in Johannesburg, are briefly elaborated here:

(1) Improving basic education

For many nations, the path to a sustainable future for their citizens begins with greater access to basic education. In much of the world, access, length, and quality of basic education are huge issues. In many countries, the current level of basic education is too low and severely hinders national plans for a sustainable future. Over the past decade, the definition of basic education has expanded to mean more than the ability to read and write. At one time, literacy and numeracy assured individuals and nations of economic prosperity; however, today's more complex international community calls for a broader understanding of society, economics, and environment, as well as the interconnections between them.

(2) Re-orienting existing education

The term "re-orienting education" has become a powerful descriptor that helps administrators and educators at every level to understand the changes required. An appropriately re-oriented basic education includes more principles, skills, perspectives, and values related to sustainable development than are currently included in most education systems. Hence, not only is quantity of education important, but appropriateness and relevance are also essential. Such an approach to education encompasses a vision that integrates a balanced approach to the issues of environment, economy, and society. Re-orienting education is also seen as developing an education that involves learning the knowledge, skills, perspectives, and values that will guide and motivate people to seek sustainable livelihoods, to participate in a democratic society, and to live in a sustainable manner. To effectively and completely re-orient education to address sustainable development, all disciplines in a teacher preparation institution can and should be involved in the process.

(3) Public understanding, awareness and training

Developing public understanding, awareness, and training was also stressed in Chapter 36. The world needs a literate yet environmentally-aware population and work-force to help nations implement national sustainability plans. To achieve such plans, specialised training programs must be developed for all walks of life. For the purposes of the Chair and the international network, this thrust will be limited to specialised training for teacher-educators, teachers, and administrators in formal education systems.

The work continues in each country and will be brought together in late 2003 when the Reporting Group will prepare a draft report to be considered by a final project conference prior to reporting to UNESCO.

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Teacher Education, Outdoor Education and Sustainability in Scotland

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Abstract

This article explores aspects of teacher education and outdoor education and their relationship with education for sustainable development (ESD) in Scotland. It considers recent developments in national education policy and the UNESCO (United Nations Educational, Scientific and Cultural Organisation) initiative to 're-orient teacher education towards sustainable futures' with which the Faculty of Education of the University of Edinburgh is involved. The policy and practice of the faculty is discussed in relation to this national and international framework.

National Policy on Sustainable Development in Scotland

In July 1999, a Scottish Parliament convened in Edinburgh for the first time in almost 300 years. Whilst Scotland remains a part of the UK, a wide range of responsibilities and powers have been devolved to this parliament which include a number of policy areas central to ESD. These include environment, education, transport and health. However, some important policy areas such as energy and some fiscal measures are not devolved and this gives the parliament less room for manoeuvre.

As a signatory to Agenda 21, the UK government, and hence Scotland, is committed to its principles. These have been identified in Scotland through publications such as 'Down to Earth: A Scottish Perspective on Sustainable Development' (1999), which endorses the social, economic and educational aspects of sustainable development; and through the report of The Secretary of State for Scotland's Advisory Group on Education for Sustainable Development (1999) which focuses specifically on education.



Figure 1 Camping in the Outer Hebrides

In February 2000, the Scottish Parliament passed a motion committing itself to placing sustainable development at the core of its work and in August 2000 the Scottish Minister for the Environment published a draft comprehensive environmental strategy. Although given credit by commentators for its attempt to open up discussion on sustainability issues, it was roundly criticised for a 'business as usual' approach and a lack of practical ideas. This is not to suggest that until now there has been no policy on sustainable development, rather that it has been piecemeal rather than integrated. Consequently, the general public has largely remained unaware of public policy in this area.

Structure of the Educational System at the National Level in Scotland

Whilst there is no national curriculum prescribed by statute, there is nevertheless a national framework which is published by the Scottish Executive Education Department (SEED), which is universally acknowledged to constitute an appropriate curriculum (5–14 Guidelines) (SEED, 2000). That curricular framework in the primary school covers language studies; mathematics; expressive arts; environmental studies; and religious and moral education. In the secondary school the curriculum framework covers language, mathematics, social studies, science, technology, physical education, and religious and moral education. These areas of study are not legally binding on schools: nevertheless, there is a strong professional consensus that these represent the major domains of human enquiry and reflection, into which all pupils as a matter of right, are entitled to be initiated.

Education and National Sustainable Development Policy

There is no explicit linkage between the educational system and the national sustainable development policy, and although in general terms the importance of education for the success of the policy is recognised, there is no mention of its role in the August 2000 draft environmental strategy. Although aspects of education for sustainable development are to be found in a number of places in curricular guidance in Scotland, these neither permeate the curriculum nor are they gathered together into a single integrated ESD theme. Although individuals in schools and higher education institutions are committed to ESD, the lack of policy direction leaves the area vulnerable.

Teacher education has no explicit recognition in the national sustainable development policy. However, in numerous policy statements the importance of education is fully acknowledged in enabling government policies to be realised.

The flexibility in the school curriculum noted earlier seems to be well suited to allow the inclusion of ESD. However, research on Scottish schools shows that subject boundaries are often tightly maintained, making any cross-curricular or permeation approaches likely to lead to only modest change (Nixon et al, 1999).

Teacher Education in Scotland

In Scotland teacher education is based in six centres, all of them with a considerable tradition of specialist work and all now formally part of universities as departments or faculties. Each centre offers a full range of training opportunities for work in primary schools and in secondary schools, although there are some areas of specialist provision (e.g. Physical Education) at just one or two centres.

All programmes of teacher education in Scotland have to comply with national guidelines issued from time to time by the Secretary of State/First Minister, who is responsible to Scotland's Parliament for the quality of education in Scotland. Also, they all require to be accredited by the General Teaching Council for Scotland. That body, which has as members the majority of practising teachers, has been the voice of the teaching

profession in Scotland since 1965. It, in effect, controls entry to the teaching profession in Scotland.

While programmes must show compatibility with the national guidelines before they can be taught, there is scope for some variation between institutions on the nature of the curriculum they provide.

Structure of Teacher Certification

Teaching qualifications in Scotland are of three types: Teaching Qualification (Primary, Secondary, and Further Education). The national guidelines stipulate programme length and its general content. There are two routes into primary or secondary education:

- A student may take a four-year degree leading to a Bachelor of Education (BEd) resulting in a qualification to teach in a primary or a secondary school (the *concurrent* route), or
- First, complete a degree programme and subsequently take a one-year programme of professional education (a Postgraduate Certificate of Education - PGCE) (the *consecutive* route).

Whilst the former route has the advantage of specialist training in education, the structure severely limits the extent to which students can take programmes from other parts of their university. Those who take the consecutive route will have had ample opportunity to sample a range of university studies prior to their professional training, but this study is sharply focused.

Teacher Education Programmes and ESD

Whilst the structure of programmes is determined by the regulatory bodies, teacher education institutions can be as innovative and flexible as they wish, so long as their programmes are fully compatible with the national guidelines. Nonetheless, education for sustainable development does form part of the *guidelines* for teachers published by the Scottish Office Education and Industry Department (SOEID, 1998). These include two specific references to teachers being knowledgeable about sustainable development and competent to contribute to ESD. Although Environmental Studies is one of the areas listed for study, this is an umbrella term for a range of subjects which are taught between the ages of 5 and 14 and which, in broad terms, deal with knowledge *about* the environment rather than ESD. 'Education for Sustainable Development' is listed as an *option* which teacher education institutions may make available. Therefore, it is left to the individual teacher education institutions to determine how much emphasis is to be given to ESD, either as a separate programme or as part of 'Environmental Studies'.

Consequently, ESD components take different forms in different teacher education institutes. In some, there is a full programme of Education for Sustainable Development; in others this forms part of a wider programme of Environmental Studies.

National Developments in ESD

As a result of a national conference on the environment in teacher education in 1995, all teacher education institutions in Scotland committed themselves to the development of the BEd (Primary Education) module noted above. The application of the module and its key elements has been variable and whilst only one university (Strathclyde) has adopted the full module others have included relevant sections into their programmes whilst others have chosen a permeation model.

For some time in Scotland attempts have been made to mobilise professional support for ESD. Following the publication of the *Learning for Life* report (1996), whose major theme was sustainable development, a 'Learning for Life Group' was convened. This continues to meet regularly (2 or 3 times a year) and consists of representatives from all of Scotland's teacher education institutions, together with representatives of a wide range of environmental agencies. The group recently prepared a document

explaining the place of ESD in Scottish Teacher Education Institutions (available from the authors).

That group has developed resource materials for use in initial teacher education programmes, and has also developed a significant resource compilation for serving teachers. The Learning for Life Group was a key member of a group of institutions and individuals which the European Union funded to develop an in-service programme and materials for Sustainability Education in European Primary Schools (SEEPS, 1997). This significant project and other resources produced are not binding on institutions. They were prepared as ways of fostering collaboration, of minimising the duplication of work at a time when resources are scarce, and as a way of stimulating teacher education centres to devote more time to ESD.

Teacher Education and ESD at the University of Edinburgh

At the University of Edinburgh the aspects of ESD noted above are included in the general training of teachers. However, there are several courses which have a particular emphasis. The BEd (Primary Education) includes a first-year residential fieldwork week with an ESD element and a further module in ESD at the end of the fourth year. Postgraduate (PGCE) students of geography have two fieldwork weekends with the emphasis as above, and an assessed part of their course which specifically addresses the role of geography in teaching for a sustainable future.

It is clear from the outline of teacher education in Scotland that room for manoeuvre is limited. However, within such constraints the Faculty of Education of the University of Edinburgh is now committed to a number of projects. For example:

- In the BEd (Primary Education) the faculty will undertake an audit of the Environmental Studies course to see whether the ESD element can be enhanced. One current development is the inclusion of a course on 'Technology and Sustainability' within the Year 4 Option on Science.
- The faculty website 'Educating for a Sustainable Future' (<http://www.education.ed.ac.uk/esf>) has been updated and further developed in a collaborative project with Manchester Metropolitan University.

Outdoor Education

Outdoor education has often been considered to be an approach to education which can permeate many curricular subject areas. Whilst outdoor activities are likely to dominate common perceptions, outdoor education is now seen within the profession as both an approach and a subject in its own right drawing on three integrated areas of outdoor activities, environmental education and personal and social development.

The themes of outdoor, adventure and education are all important in the process. An experiential approach to learning is a central tenet of outdoor education and in this context 'adventure' is seen as an approach to maximise the learning effect of the experience (Higgins and Loynes, 1997). Scotland was one of the first places in the world where outdoor education became formalised and in the 1960s and '70s there was a significant focus on the environment (Higgins, in press).

Outdoor Education and ESD

The natural environment is often considered in a utilitarian way as 'the workplace' for outdoor education (Figures 1 to 4). However, this perspective denies both the roots of outdoor education and a number of contemporary initiatives which emphasise the value of direct experiences of the natural heritage in education about the environment (field studies), fostering a 'sense of place' and in education for sustainable development (Cooper, 1991; Nicol and Higgins, 1998; and Higgins, 1996). Central to this approach is the view that development of a relationship

with the environment is an important precursor to understanding sustainability (e.g. Palmer and Suggate, 1996).

University of Edinburgh and UNESCO

The 1992 United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro resulted in the agreement of participating nations (including the UK) on a number of environmental issues which all would address. A central commitment was the adoption of Agenda 21 (UN, 1992), an action plan for progress. The importance of education to this plan is indicated in its presence as a theme in all chapters of the document, a chapter devoted to it (Chapter 36) and its frequency of use. In the document 'education' appeared only second in frequency to the word 'government' (Smyth et al, 1997: 173).

Under Agenda 21 one of the four priorities identified was 'Education, Public Awareness and Training for Sustainability'. As a result, UNESCO is addressing teacher education, which it sees as one of the most significant areas for action (UNESCO, 1999). Hence, the task of 're-orienting teacher education to address sustainability' is a direct result of decisions taken by governments at Rio.

Perhaps as a result of Scotland's reputation for commitment to ESD, a representative of Moray House Institute (now the Faculty of Education) was invited to a UNESCO meeting in Thessaloniki in Greece in 1997 (UNESCO, 1997). There were ten universities/teacher education institutes from around the world present at that preliminary meeting, and around 30 at the subsequent meeting in Toronto in 2000.

All participating institutions attending the Toronto conference agreed subsequent actions, the principles of which are described by Hopkins and McKeown (2001). Whilst each institution is free to decide on its own actions, there is a commitment to short- and long-term objectives of the UNESCO project. The *Short Term* objective is 'to undertake research and experimentation on different approaches to re-orienting teacher education towards sustainability, using a common research framework to allow comparison of results'. The *Long Term* objective is 'to develop suggestions and guidelines for re-orienting teacher education and associated realms of pedagogy, curriculum and evaluation'.

Broadly speaking, the University of Edinburgh commitment is to review the status of ESD in provision for teacher education and outdoor education. Some detail of the actions taken has been provided earlier in this paper. Attempts continue to raise the profile of ESD at university and national level. For further details see Higgins et al (2001).

Concluding Comments

The inter-institutional collaboration between teacher education institutes and the environmental agencies noted earlier which led to the establishment of the 'Learning for Life Group' has led to a number of



Figure 2 An outdoor teamwork exercise



Figure 3 Kayaking on the River Etive

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national and international initiatives at both pre-service and in-service levels. Successful bids have been made to Scottish and European funding agencies to develop resources to support initial teacher education programmes and programmes of continuing professional development for teachers in the field of ESD.

However, a teacher education curriculum which is 'full' already, and weak political commitment at a national level mitigate against a decisive advance of ESD in Scottish education. Although the fact that education follows national guidelines rather than a syllabus allows some room for manoeuvre, many requirements are stipulated and this makes extended provision in ESD difficult to achieve. Outdoor education, free from many of the curricular constraints provides one avenue for development, but it too lacks enthusiastic political (and hence financial) support.

There can be little doubt that ESD is finally moving up the political agenda in Scotland and must eventually become an imperative for the work of teacher education institutes. Some progress has been made though progress to date has depended primarily on individual and institutional commitment.

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University of Edinburgh Outdoor Education Website: <http://www.education.ed.ac.uk/outdoored>

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Figure 4 Fieldwork on the Isle of Rum

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Sustainable Development in the UK: exploring education initiatives since Rio

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This article has drawn heavily on the original paper: Reid, A., Scott, W. and Gough, S. (2002) Education and Sustainable Development in the UK: An Exploration of Progress since Rio, *Geography*, **87(3)**: 247-255.

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Abstract

This paper derives from a contribution we made to the Council for Environmental Education's submission to the House of Commons Environmental Audit Committee (2002), and reviews educational activities in response to Agenda 21 (Chapter 36 on Promoting Education, Public Awareness and Training). Exemplars relating to policy, programmes and strategy are illustrated, alongside a commentary on their effectiveness and strategic value. We conclude that there is now a priority need for integrated and integrative leadership, both within and across sectors, which synthesises existing knowledge and good practice, and makes them available to ongoing initiatives.

Introduction: What's been done since Rio?

It is clear that a significant range of activities have been initiated in response to Chapter 36 and carried out by Central Government, Local Authorities, NGOs, and others, and exemplars relating to policy, programmes and strategy are provided below. In reviewing progress and recommending actions in these areas, we make three assumptions; viz:

- education has a crucial and unique role to play in helping us come to understandings about what sustainable development (SD) is, and how we might develop and recognise it;
- the learning that we shall need in the UK in order to do this will need to be developed and shared across sectors; and
- we all have important parts to play (individually, in the family, socially and in the workplace) in bringing such learning, and hence sustainable development, about.

These assumptions are consistent with the stance adopted by *Agenda 21*, and the UK Government's Sustainable Development Education Panel (SDEP) in that each accords a crucial role for learning at all levels in sustainable development. They are also consistent with the views of many NGOs as they are grounded in what Lindblom (1992), in discussing ideas around the self-directing society, calls 'disjointed instrumentalism'. In other words, progress in education and sustainable development will be evolutionary and iterative and what people, organisations and institutions do, on the ground, will be more important, if properly evaluated and shared, than grand social projects informed by external theories and imposed by experts.

In this paper then, we are operating with 'loose' rather than 'tight' frameworks for what is meant by education and sustainable development, and focus on reviewing the range of sectoral initiatives, rather than the projects themselves or their problems (see, for example, Scott and Reid, 1998). Before providing detail on a sector-by-sector basis, we now provide a brief explication of the agenda set at Rio, and what has been effective and not so effective.

The Agenda set at Rio

The targets set at Rio for education were ambitious. They include:

- Achieve environmental and development awareness in all sectors of society, and integrate environment and development into education at all levels;



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- Set up national advisory environmental education coordinating bodies, and assist schools in designing environmental activity work plans, and enable pre-service and in-service training for teachers and non-formal educators;
- Establish national and/or regional centres of excellence in research and education;
- Build partnerships with business, NGOs, with other stakeholders, and identify workforce training needs and assess measures taken to meet them, encouraging professional associations to review codes of practice;
- Develop national and regional environmental labour market information systems, and identify workforce training needs and assess measures taken to meet them;
- Support community-based organisations, and promote dissemination of traditional and socially learned knowledge;
- Promote sustainability skills in adult education, including business, agricultural and industrial schools and training;
- Encourage integration of environmental management training across all sectors, and encourage social participation in sustainable work practices and lifestyles.

What's been effective?

In the UK within formal education, revisions to the national curriculum have created space for innovation, and there has been an identification of sustainable development as an important aspect of curriculum aims and subject foci across the key stages. The role of government, NGOs and subject associations has been crucial in achieving this, often through partnership initiatives. Schools, however, are substantially focused on the important 'basics agenda' set by DfES which, nonetheless, in stressing literacy, numeracy and ICT skills, remains fundamental to realising sustainable development (Hopkins et al., 1996). Sustainable development initiatives across the FE and HE sectors have been attempted: the Toyne Report, HE21 and HEPS (for more detail on the latter; see article in this edition of PLANET - Ed) are significant examples. In the non-formal sector, the Council for Environmental Education (CEE), the Development Education Association (DEA) and several other NGOs have done exemplary work in advancing understanding of sustainable development and the role of education and learning in it, and in achieving an increased visibility for such issues in policy circles (e.g. www.cee.org.uk). Within non-formal education, two major public awareness campaigns have been conducted (*Going for Green* and *Are you doing your bit?*), and a statutory framework has been established which acts to create opportunities for the development of life-long learning initiatives focused on sustainable development. The Department for International Development (DfID) has taken an international lead in commissioning research into the central role of environmental learning in achieving sustainable development.

P L A N E T

What's not been so effective?

A plethora of initiatives, however, does not amount to a national strategy, and many disparate initiatives, valuable in themselves, have not yet been linked to advantage, locally, nationally and/or farther afield. Often this is because teachers, local government officers, NGO employees, and others have lacked the understanding and/or the infrastructural support to realise such integration, particularly at the interface of bottom-up with top-down approaches. Examples are the development of unconnected life-long learning and sustainable development initiatives in some local authorities, and the lack of integration between school curriculum development and LA21. Work-related to sustainable development continues to be seen as a costly bolt-on to existing programmes, rather than as a means and opportunity better to achieve existing goals.

Sectoral Analysis

We now examine educational initiatives in five sectors, setting out significant initiatives in terms of policy, programmes and strategy, along with an evaluative commentary on the main issues and challenges we now face.

1. Formal Education Sector

Key Stakeholders: Government - Local authorities - Schools

Exemplar Activities

- Department for Education and Skills (DfEE) and Department of Energy (DoE) published *Taking environmental education into the 21st century*, a strategy for environmental education in England;
- The School Curriculum and Assessment Authority's *Teaching environmental matters through the National Curriculum* provided exemplars of school and field work, 1996;
- Setting up the Government's *Sustainable Development Education Panel (SDEP)*, 1998;
- SDEP report to DfEE/Qualifications and Curriculum Authority (QCA) on *Education for sustainable development in the schools sector*, 1998;
- Establishing *Curriculum 2000*, adding ESD to National Curriculum aims (without prescribing what schools should do, or specifying learning outcomes), 1999;
- Explaining in eight of 12 National Curriculum subject booklets how ESD could be promoted, with specificity in geography, science and citizenship, 1999;
- Providing on-line support by the Qualifications and Curriculum Authority for teachers/schools in relation to ESD, 2001;
- Department for Education and Skills (DfES)'s *Developing a global dimension in the school curriculum* providing guidance for head teachers, governors and local authorities, 2001;
- DfES Curriculum Division appointing adviser on ESD, 2001.

Main Challenges

The work of the Government panel (SDEP) has had little impact on schools and FE/HE; it needs to focus on these sectors through collaborative activities with subject and professional associations and with NGOs in order to stimulate curriculum and pedagogical development. Further, it needs to lobby to make funds available for detailed research studies into work on learning and sustainable development, including meta-analyses of existing studies.

There is no coherent set of aims for the whole curriculum in England, Scotland, Wales or Northern Ireland. DfES, with QCA, needs to consult widely in order to develop this, and to show: (a) that education is a crucial component of developing our understandings of sustainable development and sustainable lifestyles/activities/futures; (b) that active partnership across sectors and between institutions is crucial for progress; and (c) that the limited opportunities afforded by the curriculum are supported by a coherent and resourced strategy for life-long learning; see Blewitt (2001).

DfES needs to: (a) make it clear that the government sees proficiency in literacy, numeracy and ICT as prerequisites for sustainable development, (b) encourage schools actively to build on this important, emerging skill basis; and (c) support schools by encouraging funding and evaluating innovative practice. DfES and LEAs need to sustain their important efforts to keep learners in full-time education, and to ensure that schools have access to either internal or external means of support for work germane to sustainable development, e.g., EU funding. Government as a whole should articulate a clear strategic vision of the relationship between sustainable development and economic growth as a driver of policy, and a strategic vision of how education (teaching and learning), and the skills agenda relate to these.

2. Post-16, FE & HE Sector

Key Stakeholders: Government - FE/HE institutions - Business

Exemplar Activities

- Establishing the Committee on Environmental Education in Further and Higher Education (Chair: Peter Toyne) and commissioning its report, *Environmental responsibility: an agenda for further and higher education*, 1993, and commissioning a review in 1996;
- Funding the CEE/MWF/DoE research project and resulting series, *Taking Responsibility in HE*;
- Funding the Higher Education 21 Project to promote examples of best sustainable practice in HE, 1997-99;
- ESRC funded *Global Environmental Change* programme (Agenda 21, Chapter 37 on mechanisms for capacity-building);
- Piloting (HEFCE) environmental management projects;
- SDEP and Further Education Development Agency encouraging sustainable development in FE through publication of *Towards sustainability: a guide for colleges*, 1999;
- Establishing (HEFCE) *Higher Education Partnerships for Sustainability (HEPS)* to help higher education institutions deliver and share strategic sustainable development objectives, 2000-2003.

Main Challenges

The momentum established through the Toyne Report was lost when HE21 failed to help a budding interest in the curriculum to flower. There is little evidence that the lessons of this failure have been learned by the SDEP – or by HEFCE where activity relating to curriculum and sustainable development is slow. HEFCE should: (a) commission and publish evaluation studies of emerging practice in relation to both academic and management aspects of sustainable development; and (b) promote networking between academic, business and professional associations. HEFCE should extend the sustainable development in FE initiative to all providers, and share and promote good practice. DfES/QCA need to ensure that new post-16 arrangements allow for sustainable development issues to be appropriately covered. DfES should encourage FE/HE funding councils to fund sustainable development-focused research related to life-long learning.

3. Non-formal Education Sectors

Key Stakeholders: Government - NGOs - Community groups - Local authorities - Business - Trades Unions

Exemplar Activities

- Government support for CEE and, through it, its many stakeholders;
- Earmarking *Environmental Action Fund* resources to support education;
- Debating sustainable development within the *Children's Parliament* on the Environment;
- DETR's *Are you doing your bit?* campaign, and DfID's *Building support for development* raise public awareness and understanding of issues, and public service broadcasting emphasises sustainable development;

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- Encouraging NGOs to carry out innovative projects on sustainable development (eg, Oxfam, Wildlife Trusts, Living Earth).

Main Challenges

DfES supports CEE and DEA as the bodies best able to represent stakeholder interests. This should continue. In a similar way there has been support for individual NGOs; however, it is not clear that schools are deriving much benefit from this. Government should ask CEE/DEA to work with QCA and others to draw together and evaluate NGO activity in relation to the formal sector.

Government needs to co-ordinate funding of education related to sustainable development to encourage innovation. Local and Regional Authorities need to integrate sustainable development and ESD into community planning and other mainstream initiatives, and all stakeholders need to put greater emphasis on engaging the media in communicating their sustainable development-focused work.

Government needs to be aware that business and trades union groups are likely to fully incorporate sustainability initiatives within their practice only where (as for example in the case of environmental management systems) these are clearly embedded within the wider context of economic growth.

4. Life-long Learning

Key Stakeholders: Government - Local authorities - FE/HE - Community groups- Business - Trades Unions

Exemplar Activities

- Establishing *Local Agenda 21* initiatives;
- Local Government Act 2000 gives local authorities the power to promote local social, economic and environmental well being, and a duty to prepare community strategies, which set out to improve local quality of life and contribute to sustainable development;
- Performance and Innovation Unit 2002 published *Resource productivity: making more with less* and *In demand: adult skills in the 21st century*, both making links between education and sustainable development;
- Learning & Skills Development Agency sponsors seminars on *Learning to Last: Skills, Sustainability and Strategy*.

Main Challenges

Local Authorities should integrate LA21 and school curriculum initiatives, and share effective practice with stakeholders. They need, with government, union, and business support, to mainstream sustainable development issues within existing and new life-long learning initiatives. The government needs to require and enable the sharing of good practice between local and regional authorities, community groups, and development agencies on sustainable development, and to ensure that current and future education/training/skills initiatives address sustainable development.

5. Multi-sector Approaches

Key Stakeholders: Government - Local authorities - Schools - NGOs - FE/HE - Community organisations - Business - Trades Unions

Exemplar Activities

- DoE publishes *This Common Inheritance*, and DETR publishes *Quality of Life Counts* listing sustainable development education indicators;
- SDEP establishes working groups on Schooling; FE/HE; the Workplace; and General Public and Households;
- SDEP produces guidance on establishing ESD awareness-raising strategies for government departments, endorsed by Green Ministers Committee;

- DfEE/DETR/CEE code for producers of educational resources supporting sustainable development;
- DfID commissions research into how environmental education can be mainstreamed into its programmes in order to help meet international development targets.

Main Challenges

Government needs to provide more targeted support for research and development in the creation of infrastructure for an effective Learning Society, and to encourage further research and development on mainstreaming environmental and development initiatives between stakeholders, especially trade unions, business and community groups. It also needs to continue to stress collaborative initiatives between, and across, all its Departments and Agencies, to ensure that the distribution of initiatives is appropriately balanced, and that more is done to turn words and good intentions into actions.

Conclusions

Our review suggests that there is now a priority need for integrated and integrative leadership, within and across sectors, which synthesises existing knowledge and best practice, and makes them available to ongoing initiatives. Such leadership would include the following:

- commissioning research, particularly into (a) the mainstreaming of sustainable development issues into learning and (b) the relationship between sustainable development and life-long learning;
- making better use of existing research, long-term cross-sector strategic planning, development of transferable skills and flexibility;
- cross-sector monitoring and evaluation of progress in education relating to sustainable development;
- identification, support and coordination of champions throughout different sectors;
- networking of practitioners in order to examine effective practice;
- promotion of, and leadership contributions to, UK, European, Commonwealth and international developments.

There is a body of existing work which has begun to explicate the necessity of cross-sectoral coherence in economic and educational approaches within which the education sector has an important role to play. See, for example, Hopkins et al. (1996), Gough, Walker and Scott (2001), Gough and Scott (2001), Scott and Reid (1998; 2001). Government, its ministries and agencies have a crucial role in stimulating such leadership, and in ensuring that local, national and international funding is well-targeted and readily available. They have an equally important role in encouraging all stakeholders to take the initiative. In providing this encouragement, government should also have an eye on how learning can be identified and consolidated amid the plethora of initiatives that such an approach will stimulate. A national strategy is now needed across all education sectors. The recent World Summit on Sustainable Development in Johannesburg presents an excellent opportunity to review the many UK educational initiatives, to learn from them, and to develop a coherent approach.

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Sustainable development education in the UK: the challenge for higher education institutions

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Abstract

This brief article outlines some of the UK initiatives towards sustainable development education and the sorts of sustainable development standards that all practitioners and professionals would be expected to accord with if the Government Sustainable Development Education Panel proposed recommendations are adopted.

Defining Sustainable Development Education

Sustainable development education enables people to develop the knowledge, values and skills to improve their quality of life in ways that simultaneously protect and enhance the Earth's life support systems.

UK Initiatives - The Sustainable Development Education Panel

In 1998 a Government Sustainable Development Education Panel was established to consider issues on education for sustainable development, in its broadest sense, in schools, further and higher education, at work, during recreation and at home; and to make practical recommendations for action in England.

The Panel reports directly to the Deputy Prime Minister and the Secretary of State for Education and Employment and is chaired by Sir Geoffrey Holland, the Vice-Chancellor of Exeter University. It is in its fifth year of operation.

Its Terms of Reference

- to promote a strategic approach to sustainable development education in England;
- to identify gaps and opportunities in the provision of sustainable development education and consider how to improve that provision;
- to promote an approach which will reduce duplication, increase cooperation and develop synergy between all sectors and groups involved;
- to consider whether and what targets should be set for various sectors;
- to highlight best practice and consider the means of disseminating it more widely;

- to make recommendations to key players on priority areas for action;
- to assess the effectiveness of this approach.

The general idea is that sustainable development education should be a seamless process which begins in the nursery and is systematically progressed throughout the formal education process and reinforced in society. The Panel set out its key aims for the further and higher education sectors in its first Annual Report.

It calls all FHE institutions, by the year 2010 to:

- be accredited to an internationally or nationally recognised sustainable development management systems standard;
- have staff fully trained and competent in sustainable development; and be providing all students with relevant sustainability learning opportunities.

Within the same time frame it also calls on the Higher Education Funding Council to:

- have made a defined level of sustainability performance relating to house-keeping, curriculum and community responsibilities, a condition of grants to institutions.

These recommendations embody a view that students learn from their learning programmes and from the learning environment; that institutions should practise what they teach; and that the principles of sustainable development should be consistently reinforced through all learning settings and learning programmes. They also embody a recognition that the FHE sector needs to define acceptable sustainability standards both in terms of its core business (i.e. education and research), its house-keeping practices and its broader community responsibilities.

So far, most progress has been made in relation to house keeping practices. We now have in place a range of cross-sector national policy initiatives to encourage and reward environmental responsibility e.g. waste reduction and energy efficiency. There are also a number of FHE specific initiatives designed to generally encourage the integration of environmental or sustainable development responsibilities into FHE management practices, for example:

- the Forum for the Future's HE 21 Project (1997-99) and its Higher Education Partnerships Scheme (ongoing);
- the Higher Education Funding Council's Environmental Management Guide (1999);
- the Association of Colleges Towards Sustainability Guide (2000).

As regards raising the competence of academic staff and implementing the necessary adjustments to academic programmes and professional standards, progress is slow.

The first challenge has been to identify exactly what sustainability learning is required by different professions. In 1999 the Sustainable Development Education Panel in partnership with the HE 21 Project, developed sustainability learning specifications for four HE sectors: business, design, engineering and teacher education.

In its second year the Panel began to think more specifically about the role of professional bodies and it undertook a review of the responses of twenty key professions to the sustainable development challenge. It came to the conclusion that a new kind of mechanism was needed to ensure that sustainable development standards were integrated into professional practice.

It is not clear yet exactly what this mechanism will be, but there is currently a proposal being considered by ministers for the establishment of a series of sustainable development standards open to all professionals. This proposal has been led by Sustainability First and the Institute of Environmental Management and Assessment.

Sustainable Development Standards

Two kinds of standard are proposed.

(1) The Guardian Standards

These would be relevant to all practitioners and professionals and be knowledge based. Accreditation to the Guardian Standard would confirm a defined level of sustainable development literacy.

The rationale for the establishment Guardian standards is that all professionals and practitioners have sustainable development responsibilities and that they should all embrace their guardian role.

The Guardian Standards would provide a stimulus for the provision of relevant continuing professional development programmes and the integration of appropriate SD elements into further and higher education programmes. They would also provide a steer to specialist environment / sustainable development departments in universities to re-shape and re-target some of their specialist programmes. The Guardian Standards would not supersede or negate existing professional standards. They would be complementary and voluntary.

The second set of Sustainable Development Standards proposed, which would also be assessed at practitioner and professional level, may be thought of as:

(2) Advocacy Standards

These would be relevant to individuals who in one way or another are championing sustainable development e.g. within their organisations, across their professional constituency; across the local community or through work in the voluntary sector.

Whilst there is much talk about sustainable development, the truth is that sustainable development is not yet a mainstream concern for most people. We need advocates to catalyse engagement, innovation and entrepreneurship in the sustainable development process: advocates who exhibit intellectual clarity, far sightedness and personal integrity; who are skilled at resolving conflicts and at bringing people together to find solutions.

Sustainable development advocates are likely to be drawn from a wide range of professional backgrounds. It would therefore be feasible for an architect or an accountant or an engineer with an interest in sustainable development to acquire the knowledge and skills to become a sustainable development leader. And it is clear that sustainable development advocates will be needed to help remove the barriers which are preventing the various professions from fully engaging with the sustainable development challenge.

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How can Higher Education produce graduates with the capacity to accelerate change towards a more sustainable society?

Andy Johnston and Heloise Buckland
Forum for the Future

Abstract

This paper will explore the Higher Education Partnership for Sustainability (HEPS). HEPS is a collaboration of 18 Universities and Colleges contributing towards sustainable development. The purpose of HEPS is to help institutions deliver their own strategic objectives through positive engagement with the sustainable development agenda and to share that experience across the sector. It lays out the key framework of the project and the areas of work within Higher Education Institutions and across the Higher Education sector that have been identified as critical to achieving this aim. It goes on to update the reader on activities since HEPS inception in October 2000.

The Higher Education Partnership for Sustainability (HEPS)

HEPS is a three year initiative established by Forum for the Future in 2000, involving 18 Universities and Colleges from across the UK. The project focuses on the potential contribution that Higher Education can make to sustainable development. Such a contribution can be made in many ways, but by far the most significant will come from the qualities of the graduates and their capacity to accelerate change towards a more sustainable society. There is limited time to get this right as the evidence of unsustainable patterns of growth becomes more compelling by the day. For this reason, a key test of a Higher Education Institution's value should be whether it gives students a total experience that makes them both capable and willing to accelerate change to a sustainable society. This recognises that all of the experiences and influences that students have affect their learning, both formally and informally.

An institution's staff are capable of improving these experiences with a combination of formal teaching and research and informal influences such as campus management and community relations. HEPS is encouraging good practice in these areas, as shown below in Figure 1:

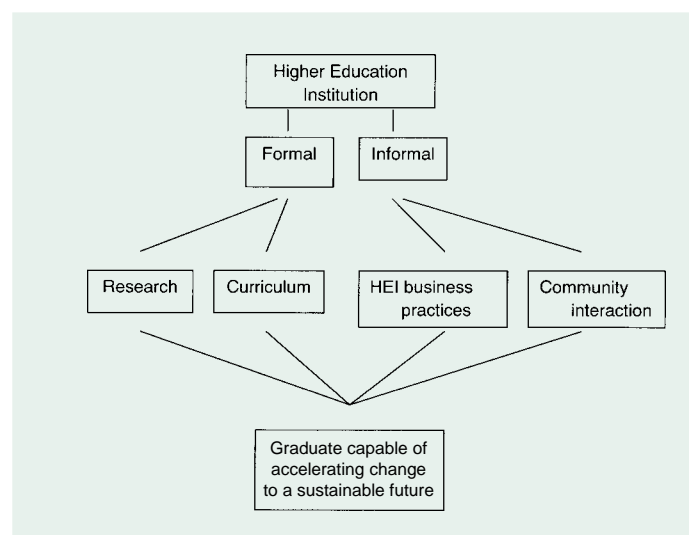


Figure 1 Schematic diagram of the HEPS approach.

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By taking each of these areas in turn, we will outline our approach to demonstrating that HEPS offers a framework which has the potential to produce graduates capable of accelerating change towards a more sustainable society. Although all staff in Higher Education Institutions have a role to play, the particular role of academics is crucial in recognising the linkages between all of these areas.

Curriculum

Forum for the Future has developed a curriculum development 'toolkit' to integrate sustainable development into the design of all types of learning activities, from short one-day training sessions to whole degrees or continuing professional development programmes. The methodology was developed to meet the following criteria:

- **Learner focused** - this is not only good educational practice, but also makes the connection between the real-world and the educational experience. Rather than examining knowledge and skills based on what is available to teach, there is a need to focus on what is needed by the learner, which will be constantly changing.
- **Holistic in nature** - life is made up of a complex network of relationships in a world of economic, social and environmental components. To ensure that these relationships flourish, they need to be examined comprehensively. Figure 2 shows a learner profile used in teaching sessions to encourage participants to identify key relationships.
- **Outcome led** - identifying the desired capacities of a successful graduate is a way of avoiding incremental improvements which may be constrained by current knowledge, practice and resources. The course can then be objectively assessed against learning outcomes.
- **Applied at varying levels of complexity** - so the approach can be simple and quick for a short module, yet has the capacity to be used for more sophisticated, longer courses.
- **Compatible with the learning environment** - not only the physical environment but also the socio-economic make-up of the learners and teachers will affect the course and should be factored into the design of any curriculum



Figure 2 A learner profile used in teaching sessions to encourage participants to identify key relationships

The methodology developed is transferable across sectors and can be used in business, government and other organisations. The process begins with identifying the key relationships that a person (employee, graduate

or citizen), would want to operate effectively so that they can maximise their contribution to sustainable development. Crucially, the relationships with social contacts and with the non-human world are included within this process. The knowledge, skills and capacities required to manage these relationships are then identified and distilled to give identifiable aggregations of learner needs, and subsequent learning outcomes. In terms of delivery, an appreciation of the shared values of staff, students and the community must be fully integrated into the course.

The tools were initially developed for the University of Antofagasta, Chile (Figures 3a-c) on request for methodologies to integrate sustainable development into the faculties of law, medicine, teacher training, marine resources and engineering. These methodologies were delivered over the course of a week-long workshop with mixed groups of 60 professors and students from the aforementioned faculties. By the end of the workshop the students and staff used the methods to design new courses ranging from web design to outdoor education and microbes and society. These methodologies are now contributing to course design in the UK, for the design of a BA in Sustainable Development at The College of St Mark and St John, Plymouth, and as part of the content for the new MSc in Sustainable Development at Stirling.



Figures 3a-c Students at The University of Antofagasta, Chile, working through various tasks within the HEPS curriculum development 'toolkit'

Research

In light of the need to accelerate change to a more sustainable society, the subject and justification of research requires a re-examination and the way in which research is rewarded must also change. HEPS is engaged in a process of seeking to influence the Research Assessment Exercise but recognises that there is a need to produce evidence to support such a case. For this reason, an exercise of defining and then quantifying research that contributes to sustainability is a major project for 2003.

Higher Education Business Practices

Most individuals learn a great deal from everyday experiences. An institution in all its practices should therefore 'walk the talk' in terms of sustainable development. This means that an institution should manage its resources by maximising efficiency, taking cognisance of the social and environmental impacts in any supply chain, carefully manage the biodiversity on site and actively increase the human capital of its staff and students.

Higher Education in the Community

The HEPS process is not, however, about creating sustainable Higher Education Institutions in splendid isolation. Universities are only useful if they contribute to society and the communities they serve. HEPS is undertaking case study research in Liverpool and Salford to demonstrate the positive outcomes of interaction between an institution and its local community.

HEPS 2002: Progress so far

The HEPS work to date, falls into three main categories:

- **Institutional** - working individually with 18 partner institutions
- **Curriculum** - generating tools and guidance transferable to all UK Universities and Colleges
- **Partnerships** - working in partnership with other organisations who have influence in the sector

On an institutional level there have been a variety of approaches taken to co-ordinate Universities' contributions to sustainable development, from amending an institutions' strategic plan to setting up interdepartmental sustainability strategy groups. The activity this has generated ranges from more efficient resource management (for example, energy and water use, the way buildings are used, and how people travel to and from the campus), better buying practices, enhanced staff development opportunities and innovation in the curriculum for new modules and courses, to inter-disciplinary seminars and auditing processes.

Reports and guidance have been produced on sustainable purchasing, finance, transport, construction and resource management. At the institutional and curriculum level, a tool-kit has been developed to integrate sustainable development into the curriculum and staff development. A web-based sustainability reporting system is also being developed which will enable institutions to measure and communicate the difference this activity makes to their core activity.

At the same time, other organisations are responding to the sustainable development agenda. They range from those who previously had not formally engaged with it such as SCOP and UUK who have recently set up a sustainable development strategy group, to others who had previously only been involved in environmental issues; such as the Environmental Association of Universities and Colleges who are now producing sustainable purchasing guidelines for Further Education colleges.

Conclusion

There are many ways in which the HE experience can increase the capacity of its graduates to accelerate change towards a more sustainable society. Key to this is capturing the many learning opportunities in both HE and the wider world. The HEPS is proposing action on all major influencing factors and would welcome feedback on how we might better achieve our aims.

More information can be found at <http://www.heps.org.uk> or by contacting:

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The HEPS is a three year initiative established by Forum for the Future in the summer of 2000 involving 18 universities and colleges from across the UK. The HEPS is funded by the Higher Education Funding Councils of England, Scotland, Wales and Northern Ireland.

Andy Johnston and Heloise Buckland

Forum for the Future

Education for sustainable development by web-based distance learning: postgraduate teaching of virtual PgDip/MSc courses.

David Eastwood
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Abstract

This paper looks at the use of web-based distance learning to teach sustainable development at the University of Ulster. The article considers virtual courses and discusses course structure, delivery and communication and how to 'track' assignments in a virtual world. The paper concludes with a consideration of possible future initiatives that would add strength to this type of course and its delivery.

Virtual Courses and E-Learning

Virtual (distance) learning courses, using E-learning techniques, can offer substantial and unique opportunities to education for sustainable development, particularly at postgraduate level. E-learning is made possible using modern Information and Communication Technology (ICT) tools, such as www; e-mail, chat-rooms etc, leading to virtual courses which can be correspondingly much more flexible than their traditional campus-based counterparts. The advantages include:

- **Space flexibility;** largely geography free – given the ever-expanding modern availability of PCs and web access, virtual courses offer the opportunity for genuinely international courses with international curricula and teaching.
- **Time flexibility** – although it is usually possible to complete virtual PgDip/MSc courses in full-time mode, the vast majority of students on virtual courses are part time. On-line courses allow students to study any time and (within given deadlines) essentially at their own pace.
- **Motivated students** – the vast majority of students on virtual postgraduate courses are looking for personal development and/or career enhancement. Normally, therefore, virtual PgDip/MSc courses are designed to accommodate and educate students who already have significant interest (usually professional interest) and motivation, as well as relatively high levels of existing subject knowledge. This is essential as greater spatial and temporal flexibility places correspondingly greater demands on students to be strongly motivated, self-disciplined and organised in order to succeed.

Course Structure

The course structure for virtual PgDip/MSc courses at the University of Ulster follows a standard formula of 4 modules comprising the PgDip element and (given satisfactory performance on the PgDip element) an MSc component. Thus the virtual PgDip/MSc in Education for Sustainable Development (to begin Feb 2003), which is designed essentially for the international professional teaching market and especially for teachers in developing countries, has this structure:

- Module 1 - Education for Sustainable Development I (theory and principles)
- Module 2 - Education for Sustainable Development II (applications and practical exercises)
- Module 3 - Sustainability Management (economics, legislation and policy)
- Module 4 - Environmental Issues (managing issues of sustainability)
- MSc dissertation

In theory, however, the potential advantages of virtual teaching for sustainable development go way beyond any single formal PgDip/MSc course teaching. For example, it is not necessary to complete a whole course. Access can be broadened by certificating individual modules as necessary. Much more importantly, however, potentially, individual modules could be disaggregated and customised, (a) to encompass localised data sources, and (b) to open access to a much wider potential audience, for example as a localised and non-course specific information source for sustainability issues, and/or as an educational tool for promulgating a local education for sustainable development agenda.

Course Delivery

Delivery of the Ulster PgDip/MSc course in Education for Sustainable Development will follow the model already successfully developed within the School of Biological and Environmental Sciences for its extant virtual MSc courses in Coastal Zone Management and Environmental Toxicology. Using a Web CT platform, this consists of a home page detailing administrative matters, course outline, syllabus etc and, more importantly, the availability of library materials accessible online. Course materials are presented using a multimedia website including course text enhanced by graphic illustration with drill down interfaces and self-test facilities. Text is further enhanced by both voice-enhanced powerpoint and illustrative active video clips. Voice-enhanced powerpoint offers enormous scope for bringing additional expertise into the course using short, illustrative lectures/discussions from lecturing staff at other universities and from both the business and sustainability professional communities. Video clips have already proved excellent for clarifying difficult-to-visualise processes, (e.g. on the Coastal Zone Management course to explain saltation and beach morphodynamic), and time lapse videos are excellent for enhancing understanding of longer-term sustainability, issues such as problems of erosion.

Design of course materials is, of course, fundamental to the success of virtual teaching. However, following in the steps of the excellent course materials developed by the Open University, it seems fair to say that the quality of resource materials is usually much higher for virtual teaching than for more traditional courses, and this not just in an online context.

Course Communication

Communications with and between course students operates through a 'communication centre' employing discussion boards, chat rooms, email and whiteboards in a combination of synchronous and asynchronous modes. The asynchronous discussion board is used largely for administrative postings, e.g., module results, new library announcements, etc. Similarly, the internal email programme is also essentially asynchronous, but is used to arrange synchronous communication with other students and staff via chat rooms and whiteboards.

Clearly, one of the limitations of virtual courses is the lack of direct face to face contact and interactions with other students and staff. However,

this can be substantially reduced by the use of synchronous chat rooms which enable group discussions, e.g., tutorials, seminars, role plays, to take place in real time.

Of the > 30 students on the current Coastal Zone Management PgDip/MSc, only one is in the UK and a few in Europe. It has been a constant source of amazement to staff how students scattered across time zones in the Philippines, Seychelles, Brazil and Mexico ignore their sleep patterns to pursue gregarious course activities. Significantly, of the six chat rooms available for this course, four are also recorded, thus allowing Ulster staff not always to ignore their own sleep patterns and to add their own comments later in their own time! Whiteboards are also available synchronously to clarify issues needing drawings or diagrams.

Assignment Tracking

Assignment tracking operates via an Assignment Centre comprising an assignment list page which outlines assignment details, deadlines and deliverables and an interactive drop box through which students submit work and receive grades and comments. This not only allows the progress of students to be carefully monitored in terms of assignments submitted and grades received, but also has the huge advantage of allowing tracking of students' accessing of information for preparatory work, e.g., dates first/last accessed, number of system hits, which articles consulted etc, i.e., a much closer monitoring of student interest and working practice than is possible for traditional, non-virtual students.

The Future

Looking at current developments in PgDip/MSc Virtual tracking and e-learning, it is clear that virtual courses already offer significant generic advantages to education for sustainable development. These include:

- Substantial opening up of the professional development market through flexible time and space access;
- The ability to build a substantial range of 'deliverers' into a course, including personnel from different universities, business, NGO's professional bodies, etc.;
- The opportunity to easily disaggregate courses into individual modules/components, etc for specific local purposes.

Expanding on these generic advantages of virtual courses, it is clear that the predictable future will include:

- Consortia of universities (usually international consortia) delivering joint courses, operating in either aggregate or disaggregated formats;
- The development of genuinely international teaching and education in international issues (such as sustainable development).

Promoters of education for sustainable development now need both to recognise these trends and to grasp these opportunities, optimising them positively and practically. In the UK context, in an ideal sense, this should now involve:

- A consortia of UK universities to deliver a joint education for sustainable development course (probably initially a PgDip/MSc, but subsequently a programme including undergraduate and sub-degree teaching). Subsequently, this consortia should expand internationally.
- Organisation of 'interested parties', i.e., academia, business, NGO's, professional bodies, to create an agreed teaching programme, including not just the curriculum/course materials, but also who should be involved in delivering the course, e.g., the business sector for once not just criticising academia for what it teaches, but being actively involved itself in course planning and course delivery.

Virtual courses have already broadened the access base to education for sustainable development. It is now time to broaden the delivery base.

Perhaps LTSN-GEES may see an organising role?

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Sustainability, Systems Thinking and Professional Practice

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Abstract

This article describes a one-day foundation course on sustainable development, based on systems thinking and practice. The course uses dialogue and inter-professional learning to explore approaches to sustainability in a variety of organisational contexts. It introduces the thinking behind sustainable development and provides tools to support the integration of sustainable development principles into professional practice.

Introduction

Amongst the 5.5 million people in the UK who call themselves professionals there is a growing realisation that they need help in understanding how to put the principles of sustainability into practice (Martin and Hall, 2002). Professionals in all sorts of roles increasingly have to demonstrate their competence in complying with complex sets of environmental, social and ethical parameters. These trends have a fundamental bearing on the curricula of higher education programmes, since many professional bodies now rely on accredited degrees as the main route for membership. Many universities have ratified their commitment to 'playing a leading role in developing a multi-disciplinary and ethically orientated forum of education in order to devise solutions to the problems linked to sustainable development' in the Copernicus Charter (1993). However, implementation of these principles has proved to be more difficult and progress is frustratingly slow.

Professional Practice for Sustainable Development

It was in this context that a new initiative, Professional Practice for Sustainable Development (PP4SD), came into being in 1999 (Martin and Hall, 2002). This initiative set out to work in partnership with fourteen professional institutions to create a common curriculum framework for sustainable development from which to test and publish training materials. The materials developed were aimed at professionals from varying backgrounds, including business, academia and consultancy. This paper describes the design and delivery of a one-day foundation course in sustainable development (Baines, Brannigan and Martin, 2001) designed and delivered by the PP4SD project.

The Foundation Course - a systems perspective

It was Tolstoy who wrote that the greatest threat to life is habit. Habit, he argued, familiarises us to the point that we no longer really see things. We become incapable of bringing the familiar furniture of our lives into focus. A similar argument can be made about ideas and concepts, and about the intellectual frameworks that shape ideas and concepts. Concepts such as the environment, nature and civil society are familiar and we often take them for granted. Yet they are often difficult to define, partly because they carry with them a variety of implicit assumptions, which influence the way we think about them.

Professionals are no different. Their beliefs and values are largely defined by their long education and training in their basic discipline. Consequently, one of the first steps in designing a foundation course was to create, with the representatives of the professions, an agreed intellectual framework within which to explore the concept of sustainability. The framework (described in Martin and Hall, 2002) has a number of key characteristics:

- The earth as a sustainable system is dependent on the activities of a number of well-defined bio-geo-chemical cycles (Figure 1);
- The earth as a sustainable system is open to flows of energy and closed to matter (based on the first and second laws of thermodynamics);
- There are four principal ways of undermining the bio-geo-chemical cycles (Porritt, 2000; see Figure 2);
- The framework is set in a future perspective.

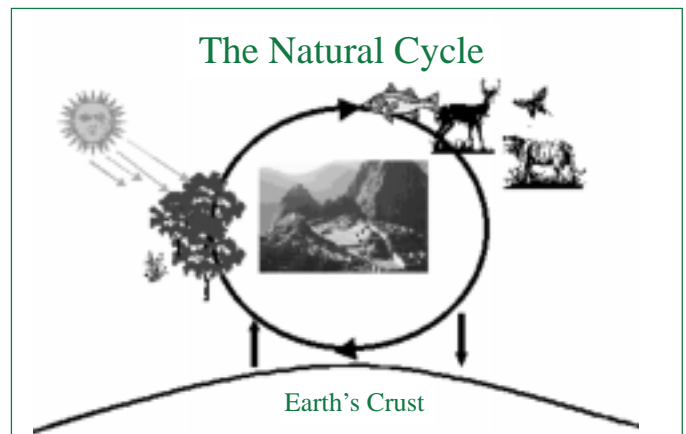


Figure 1. The basic biogeochemical cycles.

By setting the sustainability agenda in an 'earth as a system' context, it became much easier for professionals to engage with what needs to be done, rather than focusing on measuring, managing and mitigating downstream environmental impact, as environmental scientists almost exclusively do. The framework provides a mental model for defining what a sustainable world might look like and hence it crucially supports the process of inter-professional dialogue and reflection about the issues and solutions.

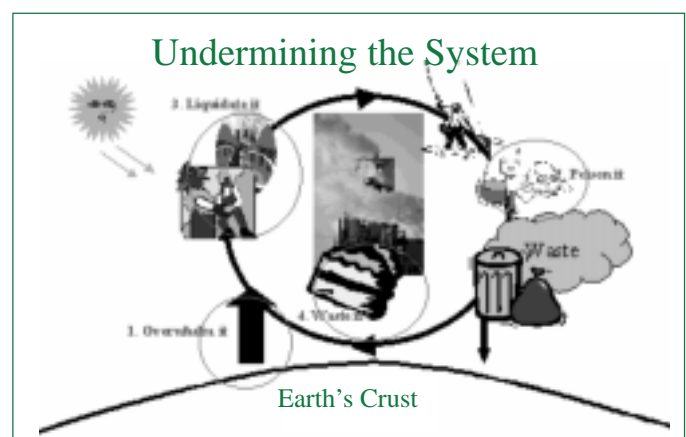


Figure 2. The principal ways of undermining the basic biogeochemical cycles

The Course Structure

The course structure is based on five overlapping themes:

- (1) the principles of sustainability;
- (2) an introduction to systems thinking and practice;
- (3) tools and techniques for taking a future perspective;
- (4) the business benefits of sustainable development;
- (5) action planning.

The course begins by asking participants to draw what they understand by sustainable development. Using the drawings as an icebreaker has been an invaluable technique for promoting and facilitating the inter-professional dialogue and learning on which the course depends. It avoids the superficial and often sterile debate on definitions of sustainable development.

Drawings provide useful ways of gathering information about complex situations and are a key element of the approach to systems thinking and practice developed by Peter Checkland (1981) and Checkland and Scholes (1990). Using pictures as a way of thinking about issues is common to several problem-solving methods because our intuitive consciousness communicates more easily in impressions and symbols than words. These pictures attempt to capture the real situation through an entirely freehand, cartoon representation of all the ideas, relationships, influences, causes and effects relevant to sustainable development.

An additional dimension to this approach widely used by systems practitioners is the use of diagrams to explore the relationships or boundaries between systems of interest. The relationship between sustainability and sustainable development is of particular importance here. Whilst these terms are often used interchangeably, they mean different things. In simple terms, sustainability means the capacity for continuance into the long-term future. Sustainable development is the journey or means of achieving the goal of sustainability. In systems thinking, both represent separate but connected systems of interest. To an individual or an organisation, sustainable development represents a 'sphere' of influence and action over which they have some control and direction, whereas sustainability, represents a 'sphere' of concern, over which an individual or organisation only exerts some limited impact indirectly through their sphere of influence. Identifying a professional's sphere(s) of influence facilitates a much more focused and productive dialogue on achievable actions and outcomes.

The course also applies a number of techniques to help participants to think in a future perspective because one of the challenges of sustainable development is developing resilient and adaptive decision-making tools that can cope with risk and uncertainty. These techniques include simple scenarios that exemplify the two different approaches we can take to the future and, importantly, how these approaches influence how we act. The usual way of approaching the future is by forecasting which starts from where we are and projects trends over relatively short time intervals, e.g. 1 to 3 years. Planning based on such trends tends to lead to short-term and incremental changes. A major limitation of forecasting is that many present trends are clearly unsustainable! The alternative approach is "backcasting" which starts by taking a 20 to 30 year future perspective based on scenarios or based on the sustainability framework outlined earlier (Ison and Blackmore, 1998). The idea is to think imaginatively about the business or organisation to which you belong and to explore a range of fundamental changes that will make it more closely fit the sustainability framework. From each alternative future created, you then work your way backwards from the future towards the present in stages, asking such questions as - what barriers did we overcome; who helped us; who did we need to persuade?

The differences between forecasting and backcasting are critical to how we act in response to the issues of sustainability. Forecasting at best offers a short-term future, but if these trends fail us, then prediction fails us. History teaches us that sooner or later trends fail because change creates deeper more fundamental issues. In contrast, backcasting starts from your anticipated destination (most sensible climbers start planning from the summit that they wish to conquer and work backwards!) and seeks to plot a course of action towards it.

Conclusion

From this brief analysis, it will be obvious that systems thinking and practice forms a core element of the design and operation of the foundation course. It helps to resolve a major issue arising from the use of traditional ways of problem solving, namely its over-reliance on linear thinking. Too much emphasis on linear approaches has already created immense environmental and social problems. This is clearly exemplified by our current approaches to the extraction and use of a variety of natural resources. The course as outlined here has been successfully trialed in over twenty different inter-professional settings. It has evolved and continues to change through a process of stakeholder evaluation and reflective practice.

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Sustaining Environmental Education: the contribution of Non- Government Organisations (NGOs)

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Abstract

Informal environmental education, including personal involvement in NGO environmental action, can be an effective way of increasing understanding of environmental issues and sustainability. NGO projects help provide practical environmental education to environmentally-aware people who have built their careers in other areas. In this case study of a community-based land reclamation research project, supported by the NGO Earthwatch, analysis of the motivations and experiences of project volunteers shows that their aims include making a personal contribution to environmental welfare, networking with like-minded individuals, and that they expect to carry their new understanding back into their everyday lives to influence the people they work with and students that they teach.

Introduction

Environmental education is not just a classroom activity. Certainly, it is possible to teach, in a formal classroom setting, about the environment and it is also possible to build upon this understanding through the involvement of students in occasional field trips. However, this kind of environmental learning, inevitably, treats the 'environment' like a 'butterfly in a museum case'; it becomes something to be examined from an objective and external viewpoint, something outside the student in the same way that it is outside the classroom (cf. Mitford, 2001, p7). Equally, it becomes something that can be forgotten when the class or course is over; something to be packed away with the second-hand textbooks and 'used' essays.

Environmental education can be effective only if it is constructed as a life-long process rather than one restricted to the few years of formal education. Ideally, it should become part of the learner's way of life and an aspect of their personal striving for self-improvement (cf. Naess, 1987).

NGOs in Environmental Education

NGOs are self-created social groups that combine people in a shared mission. In general, NGOs are about direct action, which may be political, religious, social or environmental. Action is instructive and NGOs stand for the belief that they can improve the world by 'thinking globally and acting locally' (Holliday et al., 2000). At UNCED (United Nations Conference on Environment and Development - "Rio"), the NGO Forum's set of alternative treaties committed them to a process "of educational transformation aimed at involving ourselves, our communities and nations in creating equitable and sustainable societies" (UNCED NGO Forum 1993:5.1). Environmental education, "a continuous learning process" would include developing "an ethical awareness of all forms of life... a respect for all life cycles and impose limits on humans' exploitation of other forms of life" (UNCED NGO Forum 1993:5.21).

Today, UNESCO includes the educational benefits of involvement in NGO action as one of two key sectors of environmental education. In UNESCO's definition, non-formal environmental education includes any organised educational activity outside the established formal educational system and particularly that developed by groups that assemble themselves for reasons other than learning (Fortner, 2001).

NGOs are most famous for their campaigns against destructive developments. However, many work in less media-engaged ways on the harder, slower tasks of environmental conservation, education and reconstruction, often trying to weave research and local action into a

consciousness-raising, ultimately policy-changing wholeness. Many NGOs seek to empower communities to take control and management of their own habitats (c.f. Bunch 1992, ABLH (Kenya) in Hellin, 2003, Cambray 2000). Some, like Coral Key and Earthwatch, try to involve volunteers in applied research, arguing that problem-solving is the best way to awaken a holistic appreciation of an environmental and sustainability challenge.

Case Study: Earthwatch and its 'Reclaiming the Land' Project

Earthwatch, a major NGO based near Boston, USA with branches in England, Australia, Japan (and formerly Russia until the office closed during the 1990s) is the world's largest NGO provider of funds for field research. It supports more than 135 research projects in around 50 countries. Earthwatch provides support, not through cash but volunteer field assistants who help with the leg-work of data collection (Figure 1). Since 1971, it has recruited over 65,000 volunteers for 2,800 field research projects (Earthwatch Institute (Europe) 2001a, p2).

Earthwatch's "Reclaiming the Land" project has run since 1991, in Wales and, for two years, in Bulgaria (Eisner; 1992; Cook, 2002). It tackles an international problem, the degradation of environmental quality on lands that have been 'reclaimed' after surface coal-mining (Haigh, 2000a). It researches the self-sustainable reconstruction of these lands and strives to build upon the ancient technology of forest-fallowing for the reconstruction of soils (Haigh, 2000b, Flege, 2000). In 12 years, the project has involved more than 350 volunteers from 21 nations.



Figure 1 Tree measuring during the Varteg forestation test plots during the EarthWatch camp of 1998

© Pat Woodruff

Methods

This study examines those things that the Earthwatch volunteers feel they gain by way of environmental education. Information is gathered at the application stage, when the volunteers sign in to a project, and the evaluation phase, when volunteers report back to sponsors, usually some weeks after the project experience.

P L A N E T

Earthwatch project application forms include space for two relevant questions. One asks the would-be volunteer to take 50-words to: "Please introduce yourself..." and tell their own story (cf. Tilbury et al., 2002). Another asks them to "Tell us why you chose this project? What are your expectations? What do you hope to contribute?" Responses are analysed by classifying their content into general themes; then scoring the number of times each occurs. In practice, this has meant that each record generates around 3 scores.

Later, after each field camp, the volunteers are asked to evaluate their experiences, to describe their most and least positive experiences on the project and also the personal, professional and educational impact of the project upon themselves. These comments have been classified in the same fashion as the registration forms, using - as far as possible - the same categories.

Results

Earthwatch says that it would like to send along copies of every application form and evaluation form for interrogation in this piece of research. The fact remains that they do not always manage to do this - there are usually more volunteers on a trip than either application forms or evaluations forms might indicate. Therefore, this analysis is based on 75 application forms (Table 1) and 31 evaluation returns (Table 2).

"Please tell us why you chose this project? What are your expectations? What do you hope to contribute?"

Interest in subject
(environmental reconstruction / 'healing the Earth') (26)
Environmentally concerned - hope to help welfare of world (25)
Build technical understanding of environmental problems (19)
Hope to contribute to 'worthwhile' activity (17)
Enjoy company of like-minded/interesting people (17)
Enjoy outdoor activities (12)
Work as part of a team (11)
Personal satisfaction / enjoyment (9)
Commitment to local area of project (9)
Ecotourism /adventure (9)
Working with nature (8)

Sample size: 75
Female: 43; Male 27.
Age: <20: 1; 20-40: 27, 40-60: 36, >60: 12
Nationality: UK: 39; USA: 23; W. Europe: 8; E. Europe: 2; Australia: 2;
Africa: 1

Table 1: Analysis of Project Registration Forms (1991-2001)

Discussion

An earlier stakeholder analysis concluded that volunteers' motives ranged from a wish to help conserve the environment, through meeting others with similar beliefs, and a recreational escape from an office job (Haigh, 1998). The field camps were a holiday experience less vacuous than a conventional beach and a few found a new hobby or cause to support (Haigh, 1998, p.67). Here also, the volunteers emphasise that who they work with is as critical as what they are doing. Many wished to interact with like-minded people, both in the team and in the local community. They felt that they learnt as much from discussions amongst themselves as from any specific project. They also sought the camaraderie of teamwork, the opportunity to work with nature and to conduct physical labour out of doors instead of within an office. Beyond this, many signed up because they had a concern for the environment and a wish to help 'heal the Earth'.

"What was your most positive experience?"

Enjoyed company of like-minded/interesting people (17)
Sense of achievement (9)
Working as part of a team (9)
Being a valued part of the project (6)
Involvement with local community / heritage (6)
Increased technical understanding (6)
Optimistic approach of work (5)
Seeing progress of project (2nd visit) (4)
Working with nature (4)
New experience (4)

What was your least positive experience?

Needed more time to spend with the project (7)
More instruction in field (4)

Sample n= 31

Female: 20 Male: 9 Don't Know: 1.

UK: 23; USA: 6, W. Europe: 1; Don't Know: 1

Table 2: Analysis of Post-Project Evaluation Returns

Education for Environmental Sustainability

The real priority for environmental education is to promote a change in attitude towards the environment (cf. Bonnett, 2002; Schultz, 2000). As Binn and Wright (2002, p82) note "sustainable development requires citizens who understand and care for the environment and play an active role in its management". The need is for an active approach that communicates the dynamism and indeterminacy of natural processes and also recognises that there is work that individuals can and should do (Berry, 1999, p. 84-85).

NGOs emerge as social pressure groups dedicated to problem solving, action and change. In general, they incline towards holism and espouse environmental changes that are inspired less by economics than the quality of life, be that expressed in human or more radical ecosystem terms.

True, NGOs face many problems. Most are financially stretched, which means that they need and rely on sponsorship, public, private and corporate. At present, NGOs stand alone outside the economic system; uniquely able to resist the sacrifice of long-term environmental welfare to short-term economic gratification. However, as they grow, so do their economic needs expand, so too their tendency to compromise (cf. Cook, 2002). This trend is, however, resisted by NGO supporters. These are concerned people, motivated by belief, who really believe that by 'acting locally', they can help improve the quality of the environment.

Conclusion

NGO environmental activism provides the most valuable agency for non-formal environmental education. Those who become involved, especially in problem-solving work, often deal directly with the core issues of environmental sustainability. However, the environmental education that NGOs provide differs greatly from the factual, technical and passive shadow provided in most university classrooms. This informal NGO environmental education involves the active sharing of ideas between concerned participants and the direct realisation that environmental quality can be improved by personal intervention.

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The Role of Environmental Education for Sustainable Development in Russian Universities

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Abstract

This article demonstrates how education for sustainable development has been embedded in environmental education programmes in Russian universities. It outlines the key concepts of education for sustainable development that are taught to students undertaking such environmental courses. The article will be of interest to GEES academics who are looking for ideas of how to embed education for sustainable development within existing GEES programmes in the UK.

Introduction

Following the recommendations of The UN Conference on Environment and Development held in Rio (1992), Russia took the first steps in its transition towards sustainable development. The decree of the President of the Russian Federation (April, 1996) on the "Concept of Transition of the Russian Federation to Sustainable Development" created the basis for this process. The concept emphasised the necessity of creating a methodological and technological basis for providing the transformations required for sustainable development. However, it is clear that sustainable development cannot be achieved without fundamental changes in science and education in general, and environmental education in particular, which plays a leading and pivotal role in making such changes come about.

The Reforms in Russian Higher Education

The transformation of the economic and political system in Russia over the past decade has promoted new scientific, methodological and organisational approaches towards managing higher education. Such transformations have also played an important and influential role in highlighting the education for sustainable development agenda. For example, the market reforms in the Russian economy and society at the beginning of the 1990s allowed:

- the initiation of a new system of multi-level higher education (e.g. that includes bachelors, specialist and master of science programmes) that is characteristic of the educational system in some countries of Western Europe;
- the development of private (paid) education, alongside Russia's public (free) governmentally supported education.

Therefore, within this relatively new system of multi-level higher education in Russia, education for sustainable development has many opportunities for developing and this has already begun (Kasimov, Malkhazova, Romanova and Chalkley, 2002).

Environmental Education in Russian HE

Environmental education at university level in modern Russia has four principal roles or spheres which are interconnected and of equal importance. These are:

- the propagation of ideas and information about environment protection, conservation and sustainability;
- the promotion of civic discourse and the methods by which the public can participate meaningfully in essential community decisions requiring sustainability knowledge;
- the development and dissemination of specialised, problem-focused knowledge and resources required to underpin the training of professionals active in environmental careers;
- the preparation of elementary and secondary teachers, university-level faculty and wider staff in the field of environmental education.

P L A N E T

University-level environmental education in Russia is subdivided into two categories: *Fundamental Environmental Education* and *Applied Engineering*. Fundamental environmental education is delivered principally through university faculties of Geography and also through Biology, Ecology and Economics. Applied engineering environmental education is delivered mainly by technological institutes and focuses on matters such as public safety and radiation protection.

Environmental Education in Russia is based on following approaches:

The interdisciplinary approach

Russian environmental education is interdisciplinary and problem-focused and is delivered at the boundaries between the natural sciences and the social sciences. This approach is based on the fact that fundamental discipline differences can offer different and interesting insights and approaches to solving typical environmental issues such as ecological and habitat management. In addition, an interdisciplinary approach is essential in order to prepare individual students who will eventually occupy professional positions in business, industry, government and academia. Many of these positions will be dedicated to the identification and mitigation of critical environmental problems, such as air, water and soil pollution that can negatively impact on human and environmental health if not monitored and managed effectively. This inter-disciplinary approach is also directly transferable to the teaching of sustainable development education.

Multi-level federal and regional approach

The federal component of environmental education in Russian HE is compulsory and requires a basic knowledge of environmental education issues across different subjects. Education materials for delivering the federal component are developed by the Russian Council on Environmental Education. Regional educational components reflect the unique demands of local markets, and are aimed at training specialists, enabling them to solve specific and critical problems in regional and local areas concerning environment protection.

Depending on their anticipated future work, students are trained in several specialities under the regional component:

- **General ecology** - this involves studying the functioning of ecosystems under stress and developing mitigation management strategies;
- **Geoecology** - this involves studying the interaction between natural spheres and consequences of impacts of human activity;
- **Nature management** - This involves solving problems relating to natural resource management and sustainable development.

This three-stage inter-disciplinary and multi-level approach to environmental education can be studied at three levels, each stage being relatively independent:

- **Stage One** - lasts for four years and leads to a Bachelors degree.
- **Stage Two** - this lasts for five years and involves the training of specialists. The principal difference between Stages 1 and 2 is that the latter includes a specialist Environmental Sciences component.
- **Stage Three** - this involves the training of the Masters students and is complete after six years. Stage 3 also involves an independent research project.

The Development of Environmental Education for Sustainability

Environmental education is now generally accepted as the basis for teaching education for sustainable development in Russia.

Environmental education and education for sustainable development are aimed at:

- promotion of knowledge on the environment and its condition;

- providing criteria, standards and recommendations on decision-making in the area of environment protection, and providing integrated solutions with respect to social, economic and environmental issues;
- demonstrating the benefits of economic development in synergy with natural environment protection;
- promoting the importance of technology in providing support to the conservation of natural and cultural heritage;
- developing management strategies at different levels (e.g. individual or organisational in order to minimise the anthropogenic impact of environmental problems).

Along with general principles of education (scientific character, fundamentality, evolutionary nature, historicity, integrity, systematic approach, interdisciplinary character, humanism, practical orientation, etc.) the content and methods of environmental education and education for sustainable development are based on the following key principles:

- **sustainability** (global and local use of natural resources without a contemporaneous decrease in biodiversity and regenerative capacity);
- **prevention** (lack of reliable information about the environmental effects of various human activities should be taken into account at all levels of planning, and activities causing environment degradation should be avoided);
- **environmental** (protection of the integrity of ecosystems, carrying capacity of the biosphere, biodiversity, quality of the environment, environmental impact assessment, etc.);
- **economic** (illustrating the imperative of sustainable development knowledge for effective economic management, efficient use of resources, strategic sustainable management of territories, resources and economic sectors, etc.);
- **social** (education in the sphere of human rights, conflict studies, safety of living, ethnography, anthropology, social and human ecology, etc.).

Of course, the real situation in delivering sustainable development education at universities in Russia is much more complex than the simple categorisation above would suggest. During the 1990s, many environmental educators in Russia realised that the steps required from 'knowledge to attitude to action' were often difficult and required considerable commitment from many individuals and organisations. As such, a significant amount of work still remains to be undertaken in order to embed firmly sustainable development education and action in Russian HE. We are sure that similar problems exist in UK HE as well.

Conclusion

The introduction of the modern system of environmental education for sustainable development in Russian universities requires widening international cooperation, organising special scientific, methodological and educational conferences for exchanging experiences in the delivery of such challenging agenda. We consider that the Russian-British Conference entitled 'Environmental Education for Sustainable Development' held in Moscow in June 2002 is one good example of such co-operation and the sharing of good practice across international boundaries.

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A Sustainable Development module in the Department of Economics at Moscow State University

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Abstract

This paper describes a module on sustainable development at Moscow State University. The module covers human, social, political, economic and technological issues, which together define the sustainable development agenda. The paper will be of interest to GEES academics already running similar courses, or who may be considering an increased emphasis on sustainable development in their own departments.

Introduction

A module entitled 'Sustainable Development' in the Department of Economics at Moscow State University provides an analysis of the concepts of sustainable development. This concept is intended to link socio-economic development issues with environmental issues so as to maintain a balance between them which will satisfy the needs of both current and future generations. The module provides students with an understanding of the need to move away from traditional models of economic development, that are commonly accepted around the world, towards a more holistic approach towards sustainable development. More specifically, the course includes components on understanding the role of social and ecological factors in effective long-term development; assessing the criteria for sustainable development and the main lines along which it can be achieved, and analysing economic and political factors, such as state regulation and market mechanisms, which can influence the transition towards sustainable development.

The module was prepared within the framework of a United Nations Development Programme on 'Masters Course on Human Development' framework. The length of the module is 32 hours and there are six main topics to be covered by students on the course, as outlined below.

(1) Human Development and the Ecological Factor

This topic involves understanding the role of ecological factors in human development and raising awareness about the anthropogenic effect on nature. The topic also considers how mainstream economic theories (e.g. Adam Smith, Karl Marx, John Keynes etc.) have generally under-estimated the negative externalities on the environment imposed by economic development. The topic also assesses different economic growth scenarios and how sustainable they are.

(2) The Concept of Sustainable Development

This topic starts with an introduction to the UN World Commission report entitled 'Our Common Future' (1987). This documents the concepts of future human and sustainable development and highlights how current economic development models need to change in order to incorporate more sustainable thinking. The topic also looks at other important sustainability documents such as 'The Agenda for the 21st Century' (Rio, 1992). In particular, the topic also considers in detail negative externalities (e.g. transport, global, sectoral, local) caused by current economic development and how such externalities can be internalised.

(3) Sustainable Development Criteria and Indicators

This topic considers some indicators of sustainable development such as quality of life, levels of economic development and ecological stability. The topic also covers criteria for assessing sustainable development such

as energy intensity, water intensity, pollution levels, reserves of renewable and non-renewable resources, waste management and it assesses how these can be measured over time.

The topic also looks at specific indicators of human, social and economic development and how the natural environment can be measured in terms of cost-benefit analyses.

(4) Transition to Sustainable Development: Global Perspectives

This topic takes a global perspective in considering how different countries are facing various sustainable development issues such as the maintenance of air quality, mitigating deforestation, conserving biological diversity, safeguarding freshwater resources from pollution, managing waste and land-use. The topic also looks at how lobby groups play a role in bringing about change at a governmental level.

(5) State Policy and Market Mechanisms on the transition to Sustainable Development

This topic looks at how economic policy can affect sustainable development. Macro-economic policies are considered (e.g. the use of environment taxes) and in particular the way in which they can provide incentives to promote more sustainable development. Environmental policies such as charging for natural resource usage, emissions and tradable permits are also discussed (e.g. the 'polluter pays' principle).

(6) Russia's Problems in the Transition to SD

This topic discusses why Russia needs to move towards a more sustainable type of economic development at the social level (e.g. declining health, outward population migration), environmental health levels (e.g. depletion of natural resources, pollution and waste problems) and economic levels (e.g. restrictions on investment). The topic then looks at some methods that could be more widely adopted and adapted in bringing about more sustainable development (e.g. low-waste and resource-conserving technologies, water purification plants, re-cultivation and land-use change, economic structural changes).

Conclusion

This paper has provided an overview of a module on sustainable development at Moscow State University. We believe that the course provides us students with a good understanding of sustainable development. It could be adopted and/or adapted at UK institutions to cover UK-based initiatives and policies and to link in with other environmental education modules in the GEES disciplines.

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Further copies of PLANET are available in a variety of different formats - if you would like any further information please contact the Subject Centre:

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Teaching Sustainable Development at the Chernomorsky Institute of the Moscow State University

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Abstract

This short article takes a look at a course on sustainable development at the Chernomorsky Institute of the Moscow State University. The course follows a series of core principles that are then addressed through a series of distinct but inter-related modules.

Introduction

Education at all levels is a principal component in sustainable development. Therefore, a national strategy of education for sustainable development needs to be elaborate in order to cover the many issues involved.

The main principles of such a sustainable development strategy could be as follows:

- **Integration** – systematically combining the teaching of cultural, social, economic, geographical and environmental ideas and information;
- **Historical perspectives** – teaching all disciplines with due reference to the evolution of traditions, cultural and natural heritage, etc.;
- **Fundamental character** – based on fundamental knowledge about society, economy and nature;
- **Multi-level character** – teaching education for sustainable development at all levels within the education system;
- **Monitoring and updating** – controlling the quality and “up-to-dateness”- of knowledge and revising education programmes accordingly
- **Orientation to the future** – forecasting the future of sustainable development and responding appropriately;
- **Technological character** – applying relevant technologies to assist in the process of achieving sustainable development;
- **Practical orientation** – having a flexible strategy so as to be able to respond to socio-economic changes;
- **Compliance with international programmes** - to demonstrate solidarity and acknowledgement of the fact that we all have a part to play.

The above-mentioned principles actually formed the basis for the development of a multi-disciplinary approach to sustainable development at the Chernomorsky Institute of the Moscow State University. It is possible to modify the system outlined below as a whole in order to meet the initial educational level of students, the amount of time available and the professional orientation of the students enrolled on the course etc.

The programme involves a wide range of disciplines and includes general methodological, historical, social, economic, political and environmental aspects of sustainable development. Below is a list of some of the courses for the sustainable development education programme. We hope that PLANET readers will find this of interest.

The programme modules can broadly be split into six major sections detailed below:

(1) Introduction to Sustainable Development

Theories of global development

This course describes the processes of global development (its integrity, diversity and influence on human society). The course focuses on theories

of global development, including (1) civilisation dynamics according to Toynby, (2) ethnogenesis according to Gumilev, (3) formation approach according to Marx, (4) the 'long-wave' approach according to Kondratiev, (5) theory of modernisation according to Aisenstadt, (6) limits to growth according to Meadows et al., (7) finality of development according to Fukuyama and (8) collision of civilisations according to Hangtington.

Globalisation and the problems of sustainable development

This course looks at the beginning of the 21st century and focuses on trends of global development, including; geopolitics, state, economy, science, culture, demography, cyclicity in the development of humanity, traditional and non-traditional concepts and prospects for the global evolution of humanity and the global civilisation crisis.

The Geographical sphere: its evolution and functioning

This course concentrates on notions of geographical zones and landscapes of the Earth and their associated boundaries. Amongst other things, the students study the cryosphere, atmosphere, hydrosphere and biosphere.

Global and regional environmental problems

Students on this course study the major mechanisms and processes regulating the Earth's system, including natural mechanisms and socio-economic processes which can cause global environmental changes. Methods of analysing environmental problems are also covered.

National wealth and sustainable development

Topics covered on this course include the composition and distribution of national wealth. Methods of calculating the main elements of national wealth and how this may impact upon sustainable development are also considered.

Political-geographical and geopolitical problems

The origins and development of two inter-related disciplines – political geography and geopolitics - are the focus of this module and how they play a pivotal role in education for sustainable development.

Geoinformation and cartographic support of sustainable development

This course focuses on the use of Geographical Information Systems (GIS) in identifying environmental problems. Specialist decision-support systems for sustainable development are also dealt with.

(2) Cultural and historic basics of sustainable development

Ethno-cultural basics of sustainable development

This course looks at the global causes of decreasing social-environmental stability, theories of risk assessment and management and the attitudes of individuals, groups and whole nations towards sustainable development.

Natural and cultural heritage

Topics covered in this course include understanding natural and cultural heritage as an important component of sustainable development in society. Problems of heritage protection and management of heritage are also considered.

Historical prerequisites of sustainable development

This course takes a historical perspective on sustainable development and involves an investigation of the industrial development of Russia and the Ukraine during the 20th century. The role of socio-economic and geographical factors in the types and rates of industrial transformation and their specific characteristics in particular regions of the country are also covered.

(3) Socio-demographic mechanisms of sustainable development

Sustainable development of society: paradigms, models and strategies

This course looks at the formation of systematic ideas about sustainable development and includes studying the social nature of the concept of sustainable development in Russian society.

Social protection of populations and risk management

Social protection of populations as a factor in sustainable development provides the focus for this course. Structures and subsidies of social protection for different groups of people are considered and includes highlighting social protection models in countries other than Russia. Instruments for risk mitigation, the insurance for risk and the control of risk with technological solutions are also dealt with.

Social health and sustainable development

This course looks at environment health and investigates the interactions of human communities with natural, social and industrial environments and considers how this can differ according to culture, religion and lifestyles, etc. Life expectancy, rates of morbidity, temporal loss of ability to work, numbers of disabled persons, rates of mortality include some of the sustainable development indicators that are covered etc. The module then looks at the regional differences in these sorts of parameters of social health within the territories of Russia and the Ukraine. A small amount of social health forecasting is also undertaken.

(4) Economic mechanisms of sustainable development

Economic mechanisms for the transition to sustainable development

This component covers the following material: the need for a transition towards a more sustainable type of economic development, the limits of technogenic development, environmental-economic criteria and indicators of sustainable development, principal ways of moving towards an environmentally friendly economy, state and market mechanisms in the transition to an environmentally friendly economy.

Production resources for sustainable development

This element includes: the economic assessment of the resource base globally and in the CIS countries, current and future means of technology development and the organisation of industrial production, present-day forms of territorial organisation of industry and their prospects within the framework of sustainable development.

(5) Natural resource potential in sustainable development

Natural resource potential

This course covers mineral, land, water, climatic, biological and forest resources, and considers the potential that these natural resources have in sustainable development.

Territorial organisation of nature management

The course examines natural-economic systems and the effect that anthropogenic processes can have on them and how they can be more efficiently used.

Landscape-environmental basics of sustainable development

The structure, functioning and dynamics of landscapes are considered in this course and the resistance of landscapes to anthropogenic pressures are also dealt with. Landscape planning is also covered.

Biodiversity and sustainable development

The stability of complex biological systems and the biosphere as a whole are covered in this course, including chemical and biological diversity. Theories of evolution and biodiversity, extinction and emergence of species, and co-evolution are all studied.

(6) Problems of management for sustainable development

Sustainable development and problems of social management

The role of management in the support of sustainable development and the structure of management and its associated features and principles provide the focus for this course. The development of a sustainable development management strategy in Russia and Ukraine are also covered, as are issues relating to the integrity of management information about sustainable development.

Models of management in the sustainable development of regions

This course looks at methods of expert assessment and decision-making in sustainable development and models for harmonisation of inter-departmental and inter-territorial relations and strategies.

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What is PLANET?

PLANET is the bi-annual publication of the LTSN Subject Centre for Geography, Earth and Environmental Sciences.

Its aims are to:

- Identify and disseminate good practice in learning and teaching across the three disciplines of Geography, Earth and Environmental Sciences and present examples and case studies in a "magazine" format.
- Provide a forum for the discussion of ideas about learning and teaching in the three discipline communities.
- Provide information for readers on Subject Centre activities and on related resources, conferences and educational developments.

Sustainable Development Concepts in the Training of Professionals in Natural Resources Management

A. Kapitza, Elena Golubeva and Olga Denissenko
Moscow State University

Abstract

This paper reports on a sustainable development programme offered within the Environmental Management Division at Moscow State University. The article describes the sorts of topics that students study and their personal backgrounds. Many professionals from industry and environmental organisations enrol on the course and then employ their findings and knowledge about sustainable development education in the workplace.

Introduction

An urgent need to train specialists in Environmental Protection and Sustainable Natural Resources Management in Russia led to the foundation of the Environmental Management Division (EMD) within the Geography Department at Moscow State University 15 years ago. Above all, Geographical education enables those who undertake it to have a more informed global outlook and to understand the cause and effect relationships in the physical and human environment. The sustainable development modules taught to students in the EMD enable them to understand these processes. Amongst other things, the students study the history, types, structures and development of natural resources management systems on a regional level in Russia.

The EMD programme

The Environmental Management Division provides training for students at a variety of levels (e.g. bachelors, specialists and Masters). The sustainable development programme within the division provides specialist training to students on various sustainable development topics. The list of modules offered to students is outlined in Table 1 below.

The EMD programme on sustainable development includes student-led and interactive forms of teaching including simulation games, designing of regional development models and business planning. To illustrate this point, students in their fourth year were given the task of designing an economic development plan for an area of their choice. Consideration had to be given to population, natural environmental conditions, regional infrastructure and economic issues. Each team, consisting of 3-4 members, worked on the project, presented it, and then held a discussion about it with the other students who were encouraged to look for weaknesses and critically appraise the group's work. The ensuing discussions turned out to be extremely lively and constructive.

Theoretical and Practical Student Development

Overall, the students demonstrated a high level of theoretical knowledge and good environmental awareness. This knowledge we believe is partly gained through longer-term experiences of modern students in the real-world, where they are able to experience environmental problems at first-hand. Another important element of the programme has been the engagement of the students in environmental movements and external practical work (e.g. ecological camps, ecological tourism, and national and international workshops and seminars). It is precisely these types of activities that enable students to gain valuable experiences from different countries. This in turn promotes their understanding of environmental issues and serves to broaden their ecological, social and cultural horizons. We maintain that such work-related learning should form an integral part of any course on sustainable development.

In addition to the basic education of students in the Environmental Management Unit, there has been an urgent need to create advanced training programmes. As such, the higher-level training course component offered in the Environmental Sciences Unit was developed in response to this national needs analysis. This more advanced stage of study involves staff at Moscow State University, research fellows from the Russian Academy of Science and leading specialists from different State Agencies who contribute to the training programme.

Professional Orientation of the Students

The resulting training programme includes modules on general ecology, natural resources management, environmental assessment and environmental auditing. Specialised courses include the main methods of

MODULE 1 ENVIRONMENTAL BASICS	MODULE 2 ECONOMIC BASICS	MODULE 3 SOCIAL BASICS
Introduction to Sustainable Use of Natural Resources	Economic Activity Foundation	History of Natural Resources Management
Regional Aspects of Natural Resources Use	Environmental Economics	Social geography and ecology
Topical Problems of Ecology	Natural Resources Management	Environment and Mass Media
Palaeoecology	Current Problems of Land Use	Natural and Cultural Heritage
Pollutants and their Characteristics	Advanced Technologies in Nature Conservation	Recreation and Protected Territories
Man-made Landscapes	Environmental Risk Assessment	
Methods of Field Research	Introduction to Environmental Monitoring	
Bioindication and Biomonitoring		
Development and Transformation		
Environmental Transformation Modelling		

Table 1 List of sustainable development modules offered to students in the EMD at Moscow State University

natural resources management control. The main aim of the advanced training program is not only to help participants to assimilate fundamental

environmental information, but also to empower them to use this knowledge in routine practice. As such, the professional composition of the students enrolled on this programme is considerable and diverse. By and large, high and mid-level officials and administrators from different organisations are attracted to the course. Therefore, by virtue of this, the course has a built-in 'multiplier-effect'; the students then influence the environmental protection policy for the country.

During its 10 years of activity, the advanced training program has been a great success and has influenced the retraining of high-level officials from the Russian State Agency of Environmental Protection, the Administration of Moscow and the Moscow Region, The Ministry of Defence, The Environmental Committee of Moscow Government and Trade Unions.

Conclusion

Providing environmental training for senior professionals is vital if Russia is to make practical progress towards sustainable development. However, important though it is to train such professionals, it is equally important to ensure that an understanding of sustainable development is embedded much more widely across the education system at all levels from primary to HE. Ideally, courses like the one described in this paper should be the apex of a much wider programme of education for sustainability, touching the lives of all young people, professionals and the public as a whole.

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Green Swedes - a National Initiative to Promote the Greening of the Curriculum in Swedish HE

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(An earlier version of this paper was presented at the 2nd Environmental Management for Sustainable Universities, EMSU Conference at the Rhodes University in South Africa in September 2002.)

Abstract

This article describes the work of the MINT project, set up in order to promote the greening of the Swedish HE curriculum and discussion of environmental issues in universities. The paper describes some of the project's activities and also presents evaluation evidence of its success. The paper clearly demonstrates the need for governmental financial support and a core team to direct and deliver such an ambitious programme of 'greening' activities.

Introduction

Moving society towards sustainable development is one of the major challenges for the future. The Swedish government became aware of this at an early stage and took a strong initiative towards greening the curriculum. In February 1991 it presented an Environmental Protection Bill which emphasised the importance of education and gave directives about the integration of environmental issues in undergraduate programmes (Regeringens prop, 1990). The funds, equivalent to about £560K, for a period of two years, were to be used primarily to promote this integration, but also to resource staff development initiatives in this area, and also to support other development efforts primarily in technology, in administrative and economic professions and also in teacher training.

In March 1992, the formal instruction to form what is now called the MINT-programme was given by the Government to the Council for the Renewal of Higher Education (called the Council). A special Committee to carry out this assignment, the MINT group, was created. It consists of teachers and students with knowledge and experience from many different areas who share an interest in developing education for sustainable development in higher education. The group has a part time (0.25) executive member and receives administrative support from the Council secretariat. The original focus of the MINT programme in promoting environmental issues recently changed to focus on the concept of sustainable development.

Greening projects and support

The activities initiated and supported by the MINT group have varied through the years.

The most important task has been to encourage Swedish universities and their faculties in the greening effort. Since 1992 some 35 projects, at 20 institutions of higher education, have received project grants. A special Library Project supported all of these greening projects with literature. It also initiated the building of the MINT-group's website, which presents various resources for teachers in higher education and makes available the results of the different projects and activities funded by the group (<http://www.hgur.se/envir/index.html>).

Several good examples of greening have been developed since inception of the project, and in the year 2000 a Handbook with them was published (Högskoleverket, 2000). The focus now is on publishing examples of the scientific base of sustainable development in specific disciplines at a higher academic level. The texts will all include one section on how the publications may be used in the teaching/learning interface with the students. The first book on economics is expected to be ready early in 2003 and to be available on the above website.

Other MINT Activities

Since 1999 the MINT group has organised a yearly 'Greenspiration' conference for higher education faculty students and staff. The themes



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have varied through the years but, in addition to lectures given by teachers, industrial representatives have presented their views on the expectations placed on the students as they enter working life. An important aim has also been to provide those present with opportunities for informal exchange of experiences and ideas.

In the year 2000, a group of 25 Swedish teachers, administrators, and students made a trip to the Netherlands to study the initiatives and experiences of teaching sustainability there. Apart from further contacts, this trip resulted in new common initiatives between the countries. In addition to the close contacts with the Netherlands and earlier with some in the UK, the MINT group has participated in the European auDes programme (The association of University Environmental Sciences Departments in Europe). The regular meetings which the MINT-group has with its Dutch counterparts (twice since 2000) for updates and in order to develop co-operation further, have been rewarding and mutually encouraging. The study trip by the Swedish university representatives in the year 2000 resulted in a number of remaining contacts between the participants, but unfortunately the contacts in the UK have more or less ceased.

The Council's activities are concerned with students' learning, so they are well represented in all its groups. The MINT-group has close contacts with the students' environmental network (Svenska Ekodemiker) and has financed the round table discussions organised by them at 12 universities in 2001. Their aim was to support each university's work with sustainability issues in education. The national round table discussion in Stockholm finalised this effort (Friberg, 2001).

On May 4, 2001, the Council for the Renewal of Higher Education and Swedish Ecodemics granted two individuals the MUtA award for the first time. The award is a scholarship of equivalent to approximately £2,000 for competence development and is given to lecturers at Swedish Universities who have been successful in teaching sustainable development and have been nominated by students, colleagues or university management. The final choice of the winners was made by a consulting group consisting of a representative for students, teachers, NGOs and industry officials.

Evaluation

The effects of the MINT project have been evaluated in different ways (formally and informally) and at different levels from individual feedback to collective governmental responses.

The effects of the MINT greening projects were evaluated in a survey mainly among engineering and economics students at 18 universities in 1999 (Sammalisto, 1999). The results suggest that in many places the students were aware of the greening input in their study programmes indicating that the projects may have left some results, although the greening effect may be the result of many different factors at a particular university and more broadly in society. As a result of the evaluation findings the aforementioned Handbook was produced, with an ambition to continually add more examples of good practice on the MINT website for practitioners to use.

The Handbook has been well received and reprinted twice. The comments from the universities about its practicality and hands-on approach have been positive. However, it is evident from the comments that more support for teachers and institutions in their greening efforts is needed.

The four Greenspiration conferences that have been arranged up to now have attracted around 40 participants each year. They have, in their evaluation comments, expressed the value of such a gathering just for what it is intended for; that is, ideas and inspiration in the form of relevant presentations, discussions, and new contacts with colleagues at other universities. However, the conference has not developed into a larger gathering, which indicates that it is still a rather small group of people, who are dedicated to promoting the issue.

Student co-operation has been essential for the MINT-groups activities. The students have added a student perspective to the group's work, as well as many creative ideas. They are invaluable in establishing contacts with various interest groups and have useful information about greening

efforts at the institutions. They can also use their voice in the different organisational units of higher educational institutions to promote the greening agenda.

The MUtA award system has so far run only once, but the evaluation made among some of the 27 nominees, representing 14 institutions of higher education, and the two who received the award indicates that it has reached its aim of focusing on sustainability issues in education and the teachers' efforts. The news of the award created a great deal of local attention. Even though the selection procedure needs to be adjusted, a nomination by students or colleagues is felt to be a great encouragement and incentive by a teacher.

The activity within the 'greening' network has been good and the Baltic 21 (Baltic 21 E, 2002) agreement between neighbouring countries in the region will be a good base for developing the co-operation and for sharing the experience from the greening efforts in the region. Various research projects dealing with students' learning of sustainable development in higher education will also provide valuable knowledge for the future.

The Baltic governments also provide continued support for the Swedish effort in being "a pioneer country in regional and global endeavours for ecologically sustainable development" (Baltic 21 E), and for the role of sustainable development education in this: "One of the fundamentals in promoting change and increasing participation is education. I would like to see more teachers discussing the impact of our lifestyles on the environment. Universities should offer courses on global survival issues and sustainable development in major programs..." (Statement by Mr Göran Persson, Prime Minister of Sweden, Johannesburg Global Summit, 3 Sept 2002).

Conclusions

Most of us dealing with the greening of the curriculum and with environmental issues in higher education sometimes get disillusioned when we see the many obstacles in our way and the difficulty in getting engagement and results.

That is why, at times, it can be rewarding to take a break and look back to identify all that has actually been done through the years. It is easy to see that the MINT group has taken a lot of initiatives and worked on many fronts in promoting greening and sustainability issues among the institutions of higher education. We do not have high staff levels, but even with a conservative estimate we can confidently say that the activities of the group, in different ways, have engaged most universities and colleges in Sweden, several hundreds of faculty and staff and thousands of students. We must realise that most of the work done could be likened to the sowing of seeds, which can take several years, perhaps even decades, to bear fruit. It remains for the Council or a future MINT group to evaluate the total impact of our efforts.

For more information on the MINT project, please contact: anna.lundh@hsv.se.

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Geography and Education for Sustainability in Australia



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Abstract

This article provides an antipodean dimension to education for sustainable development in that it gives an overview of geography in sustainable development education in Australia. The paper considers school level and university approaches to the teaching of this issue. It demonstrates that where sustainability education is becoming fashionable across all areas of HE, there is by and large no co-ordinated federal approach to its delivery.

Introduction

At the time of writing (late October 2002); much of Australia is in the grip of a protracted, El Nino-induced drought and the largest dust storm in decades has deposited approximately ten million tonnes of the country's topsoil in the Pacific Ocean; the Green Party has won its first lower house seat in federal parliament; the Minister for the Environment has reiterated his government's refusal to ratify the Kyoto protocol; and, as always at this time of year, the first TV reports of bush fire damage are hitting the local media. Australia, as a country on the global economic periphery and, in some ways, scarcely beyond the frontier stage of its economic development, is a land where issues of sustainability are both glaringly apparent and politically relevant. However, it is also a country of such size and diversity that uniform approaches, both to sustainability *per se* and to education in this area are unlikely to be appropriate or successful. What follows, therefore, is one perspective on a fragmented system of educational provision for sustainability in Australia. It will be coloured by my own disciplinary and residential locations (in Geography and in Western Australia, respectively) though the challenges and the responses are not greatly dissimilar in other academic fields and in other parts of the country.

School Level Approaches

Australia has six state and two territorial school systems. No two share identical age requirements for entry and progression through pre-primary, primary and secondary stages and they all devise and control their own syllabi and end-of-school examinations. Nevertheless, at least at the primary and lower secondary levels, most systems regard Studies of Society and Environment (SOSE) as one of four core streams of study (the others being English, Mathematics and Science). In high schools, the subject matter within SOSE is characteristically delivered by staff who also teach (and therefore are graduates in) History, Geography and Economics at the upper secondary level. While this structure ensures some degree of integration of the economics-environment-society sustainability triad, it also tends to separate sustainability's science and 'social studies' components.

This deficiency may be slightly ameliorated at the upper secondary level where the Arts-Science divide is less apparent than is the case in the UK. Characteristically, students are required to take four or five subjects in the final two years of high school. In most states/territories, these must include at least one from an arts and one from a science list. Since Geography falls within SOSE at lower secondary level, it is normally classified as 'arts'. The situation at the tertiary level (to use the Australian term) is, however, far more fragmented and complex.

Geography and Sustainability in Australian Universities

The Directory of Subjects of Study in the Australian section of the current Commonwealth Universities Yearbook (Association of Commonwealth Universities, 2002) makes no mention of sustainability as such. However, 39 of the 40 universities listed offer Environmental Science/Studies, the sole exception being the private, fee-paying Bond University. Slightly over half of the country's universities also offer other sustainability-related subjects, such as Natural Resource Studies (24), Planning/Landscape Studies (23), Ecology (22) or Geology/Earth Sciences/Atmospheric Studies (21). More specialist topics, such as Development Studies (14), Population

Studies/Demography (8), Wildlife Management (7) and Energy Studies (5) are also represented.

Geography is currently listed as a subject of study at 23 universities across the country, though four programmes have closed since 1998. What the Yearbook and its Directory fail to discern, however, is the extent to which disciplinary departments have disappeared from the Australian university scene in recent years (Holmes, 2002). The last single-discipline Geography department in an Australian university closed in September 2002. Many multidisciplinary Built Environment, Social Science, Geoscience and "Geography and..." departments have been created, with Environmental Studies as one of the discipline's most common partners (Harvey et al. 2002).

This has tended, if anything, to make issues of sustainability more prominent in Geography curricula at this level, geographers seek common ground and work more cooperatively with a diverse range of new colleagues, depending upon where their university restructuring processes have located them. Most of the 23 groups teaching Geography in Australian universities are therefore increasingly involved in offering courses which focus on sustainability-related topics, though they may not necessarily mention sustainability by name in their course titles.

Furthermore, now that sustainability is a fashionable topic, and in what is becoming an increasingly intense competition for undergraduate and graduate students, many Geography programmes highlight their sustainability credentials. For example units (or modules in 'UK speak') that might once have been termed Introductory Human and Physical Geography are now (e.g.) Population, Globalisation and Social Justice and Footprints on a Fragile Planet at Adelaide and Technological Revolutions and Natural Hazards at Curtin.

The Wider University Context

Geography is, of course, by no means the only discipline offering tuition in the area of sustainability. As the Commonwealth University Yearbook noted, courses in sustainability *per se*, are the exception, though the Institute for Sustainability and Technology Policy at Murdoch University offers bachelors degrees and postgraduate qualifications in Sustainable Development.

Sustainability is more likely to be linked to specific topics, such as Sustainable Tourism Development at Adelaide University. Indeed, Tourism is notable, both as an Australasian academic growth area in which many geographers have recently found employment and as a discipline with a strong sustainability focus in its teaching (a possible case of cause and effect?). The nationally designated Cooperative Research Centre in Sustainable Tourism, which provides research funding and postgraduate scholarships to sixteen universities plays a major role in directing research and therefore, indirectly, in influencing university teaching in this area.

Indeed, the bumper sticker claim that "Geography is Everywhere" (recently distributed through the Australian (school) Geography Teachers Association) could now be more accurately applied to sustainability in the university context. Searches using the word "sustainability" in university websites produced the perhaps surprising hits of "Accountants are examining the issue of sustainability" (Edith Cowan) and "the Cement Sustainability Initiative" (Curtin) to place alongside more predictable finds, such as "Sustainability and Economics in Agriculture" (University of Western Australia).

This increasingly widespread awareness/fashionability of sustainability can lead to welcome cooperation, such as the recent introduction of an Environmental Business Management major within a Bachelor of Commerce programme. But the very fact that sustainability issues are relevant across so many subject areas can also lead to turf wars. In recent years, cost-cutting in Australian universities has been even more severe than that in most of the English-speaking world (Marginson and Considine, 2000; Coaldrake and Steadman, 1998) and some academic areas have therefore sought to claim sustainability as their own in order to compete for new students. For example, at my own university, a Centre of Excellence in Cleaner Production, which focuses primarily on Industrial Chemistry, recently objected to a Sustainability Studies stream in a Social Sciences graduate programme.

Conclusion: Within and Beyond Academia

The failure of the objection cited above is, perhaps, an internal acknowledgement of the increasing ubiquity of sustainability perspectives in important worlds beyond the universities. This is notably the case in the area of government rhetoric, if not, as yet, government action. Following the publication of a State Planning Strategy (Western Australian Planning Commission 1996), which explicitly adopted a sustainable development framework, the Western Australian government has recently released a Draft State Sustainability Strategy for comment. The latter document emanates from a Sustainability Unit in the state premier's office and is intended to apply across all spheres of government activity.

While the Western Australian state government is actively working to ensure that sustainability is pervasive, rather than ghettoised within a single department, the federal government (which controls the universities) would seem to have achieved the same result in academia through benign neglect. National priority areas are identified (and frequently changed) for research and universities are expected to hit student enrolment targets ever more accurately. But, at the undergraduate level, it is generally more important, in funding terms, to achieve institution-wide goals than to conform to subject/disciplinary profiles, while postgraduate coursework is seen as a fee-paying exercise where universities can set their own targets. There is, therefore, no clear government direction with regard to education on sustainability, and furthermore no controlling professional body for sustainability studies and no clear academic location for its teaching. Most Australian universities now have Divisions or Faculties of Business/Commerce, Humanities, Science/Engineering and Health Sciences. The first three can lay claim to the economic, social and environmental components of sustainability studies respectively, while new, but related, paradigms such as Ecosystem Health (Jones, 2001) are of interest to the fourth. Given the growth in public/student interest in environmental issues, education in sustainability related areas has therefore grown in an increasingly diverse manner within an increasingly market-driven national university system.

Australian geographers, as a result of the integrative nature of their discipline, are playing an important, if uncoordinated, role in its growth. And it is, perhaps, fortunate that the issue of sustainability provides them with this opportunity at a time when traditional academic disciplines are under threat across the Australian university system.

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