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by

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on

Educating earth-literate leaders

EDUCATING EARTH-LITERATE LEADERS

by

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Introduction

We are now citizens of the Earth joined in a common enterprise with many variations. We have every right to insist that those who purport to lead us be worthy of the task. Imagine such a time! (David Orr, 2003)

Universities the world over are facing some serious challenges as demand grows for a better qualified and more flexible workforce in an increasingly complex and dynamically changing world. Globalization and further expansion of the European Union require new types of knowledge and new forms of professional expertise. And nowhere is this need for new competencies and capacity building more crucial than in the area of sustainable development where problems transcend national boundaries and call for new forms of co-operation and ways of learning (Sterling, 2001; Jucker, 2002).

But our Universities and many of those who lead and teach in them are in denial about one of the most fundamental questions facing human beings namely our very survival as a species. As one commentator has observed “only those caught deep in denial can ignore the mountain of scientific data about the destructive effects of human activity on the Earth. But only those equipped to discern and think critically will understand both the magnitude of the problems and the choices to be made if we are to create a decent and humane future.” (Orr, quoted in Sterling, 2001)

This paper explores some of the key challenges facing universities as they embrace the sustainability agenda.

The Changing Professional Landscape in the EU

For nearly three decades education policy has been driven by the perceived need to equip people with the skills and knowledge required to produce goods and services capable of competing in an increasingly aggressive global market (EU White Paper, *Teaching and Learning – Towards the Learning Society*, 1995). The new sustainability agenda has already had a major impact on the labour or occupational market for those who have taken part in educational courses and training programmes in the environmental field. The scale and range of the so-called eco-industries is summarised in Table 1.

Total Goods and Services	€183 billion / year
Direct Employment	2 million FTEs
Investment	€54 billion / year
Renewables Market	€5 billion / year

Table 1 The Market for Goods & Services in the Eco-Industries in the EU¹

¹ Includes the EU 15 and candidate countries for enlargement (ECOTEC Research and Consultancy, 2000).

In a global context the market for eco-industries is estimated at around €50 billion which means that the EU has approximately one-third of the overall market, equal to the USA (ECOTEC, 2001). Whilst this report focused mainly on pollution management and resource management other sources indicate that job opportunities for those with an environmental education have tended to spread from the public to the private sector as well as into the rapidly growing non-governmental sector of public interest organizations, not-for-profit consulting firms and various publication, media and information outlets. New posts are emerging within the agencies of the EU itself as well as inter-governmental bodies. There is clearly an increasing range of new and demanding career trajectories which universities will need to reflect in reviewing and updating their undergraduate and post-graduate programmes.

The qualifications that are now required for the growing and diverse range of jobs in this emerging labour market are significantly different from those that previously characterized the environmental professions in Europe. Most of those employed in an environmental capacity within local authorities at a national level including research and teaching staff were primarily from a natural science discipline, whereas the new positions call for new kinds of competencies in business, economics, law, politics, sociology, communications and computer science as well as in environmental ethics, human ecology, and environmental management (Essence, 2001).

In addition, there is strong evidence of a greater emphasis being placed on interdisciplinary problem-solving capability rather than a traditional and overly specialized scientific competence. In the UK and Holland this trend is now recognized by the creation of a number of new interdisciplinary professional groups, such as the Sustainability Alliance in the UK and the Dutch Association for Environmental Professionals and the Professional Practice for Sustainable Development (PP4SD) initiative (see Martin & Hall, 2002; Martin 2002).²

Educating Earth Literate Leaders

As we approach the first anniversary of the World Summit for Sustainable Development (WSSD) in Johannesburg and reflect on its impact, one thing is clear – political leadership the world over has so far proved incapable of rising to the challenge of sustainability (UNED-UK, 2002). And yet in all likelihood most of the hundred or so leaders who attended will have a higher education degree from some of the world's most prestigious universities.

This raises some serious questions for our university administrators and the governance structures. Why is it that those people who contribute most to wreaking havoc on poor communities and the Earth's ecosystems are those with BAs, MScs and PhDs and not the 'ignorant' poor from the South, as David Orr once remarked (Orr, 1994)? Why is the illiteracy amongst the world's politicians about how the world works as a living system, so widespread? Why is it so rare that we encounter in our leaders the qualities needed to enable sustainability: humility, respect for all forms of life and future generations, precaution and wisdom, the capacity to think systemically and challenge unethical actions? And more worryingly on the basis of their performance, what hope of improvement is there for future leaders?

The fact that the higher education sector is seriously failing society by producing leaders incapable of addressing our most pressing problems should trigger some critical consideration about the fundamental role of universities in society, based on three key assumptions:

² See www.sustainabilityalliance.org.uk, <http://www.vvm.to> and <http://www.ies-uk.org.uk/IES%20PP4SD.htm>

- If universities are the nursery of tomorrow's leaders and educate most of the people who develop and manage society's institutions, then the sector bears 'profound responsibilities to increase the awareness, knowledge, technologies, and tools to create a sustainable future', as the *Talloires Declaration* (signed by many of the world's university leaders) stated in 1995. This clearly implies that graduates of *every* discipline (whether as engineers, teachers, politicians, lawyers, architects, biologists, bankers managers or tour operators, etc) will need a sound working knowledge about sustainability.
- Universities the world over are regarded as the centres of the most advanced knowledge. They should therefore, through their teaching and their institutional practice, embody role models for the wider society and be microcosms of best practice for the future.
- 'Higher education institutions are allowed academic freedom and a tax-free status to receive public and private resources', says Anthony Cortese from Second Nature, a leading US institution in education for sustainability (Cortese, 1999). In exchange for this privileged position society rightly expects from universities that they contribute as much as possible to the solution of society's problems.

Add to these reflections the fact that sustainable development is now a mainstream policy issue in the UK and the EU and that there is an increasing demand for graduates with a broad interdisciplinary training in sustainable development and problem solving (Essence, 2001). All of which suggests that we should develop strategies on how to turn the universities into sustainable institutions.

Such strategies would need to be concerned with all aspects of higher education and find answers to the following questions: how is the ecological footprint of these institutions shaping up to sustainability criteria? Is the sector promoting education for sustainable development across the curriculum? Do universities fulfil their role in communities and promote sustainable development through outreach and collaboration with industry? What value has the research done in universities when considered in a sustainability framework (i.e. does it contribute to solving the most urgent problems or does it boost unsustainable practices)? And lastly, what do the graduates of these institutions do in the world? Are they contributing to the building of a sustainable society or are they, as one leading commentator says, 'part of the rear guard of a vandal economy' (Orr, 1994)?

Any analysis of the university system based on these questions is depressingly devoid of much that can be described as positive progress. The university system has not been at the forefront of implementing sustainability and has even lagged behind developments within the school system (UNESCO, 1997). The main reason cited for the inability of our universities to engage in this transdisciplinary endeavour called sustainability is that 'the frontiers between academic disciplines remain stoutly defended by professional bodies, career structures and criteria for promotion and advancement' (UNESCO, 1997). The university system ignores this issue at its peril because, as the International Association of Universities has stated, 'Universities must not forfeit their natural claim to leadership. If we do not get involved...to help solve the overwhelming problems of our global society...we shall be ignored' (IAU, 1993).

Sustainable Universities?

There are a growing and in some senses an overwhelming range of tools and techniques available to any institution or organization setting out on the sustainable development journey

(see for example, www.projectsigma.com; www.naturalstep.org.uk; www.unesco.org/education/tlsf). Whatever the approach the action taken should be based on a number of important guiding principles. (Bartel *et al*,2001; Jucker, 2003). One of the most useful approaches is based on the five capitals model (Sigma, 2003) because sustainable organizations need to actively manage five types of assets that they rely on and contribute to. They are:

- Natural capital (the environment)
- Human capital (people)
- Social capital (social relationships and structures)
- Manufactured capital (fixed assets)
- Financial capital (profit, loss, revenue, etc)

It is important to stress that these assets also need to be managed for the long-term not just for the immediate future, thereby building up stocks of capital and living off the interest. They are also interdependent because changes in one will probably cause an impact on another. However, in this model, one form of capital cannot simply be traded against another.

Universities like any other organization play a significant role in how these various forms of capital are used, developed and maintained. The most obvious one is exploiting the flows of energy and resources from the earth's biophysical systems (e.g. land, air, water and natural systems). They also contribute to the other major form of capital which flows from the hands and brains (i.e. human capital) of the academics who work in them and the students they teach. These are the only two real sources of wealth in the world, everything else – money, machines and institutions – are derived from these primary sources. Sustainability can only be achieved if the stock of capital is kept intact or increased over time. If our universities deplete or consume more than they build up or invest, then their and others' opportunities to consume in future will inevitably be reduced. At the heart of the current environmental crisis is the way in which our levels of consumption and production contribute to the unsustainable depletion of the Earth's natural capital to the extent that the ability to support the projected human population levels is seriously questioned (Wilsdon & Porritt, 2000). Even a cursory assessment of how our universities currently operate demonstrates the significant and serious gap between the aspiration of becoming more sustainable and current practice.

Ecological Footprint of Universities

A useful measure of sustainability within an institution is through a technique called Ecological Footprinting (EF). This is a simple aggregate indicator of human impacts and is usually defined as the bio productive area (of land or sea) that would be required to maintain current consumption using prevailing technology (Wackernagel & Rees, 1996; Chambers, Simmons & Wackernagel, 2000). Those authors behind the EF concept have come up with the notion of 'Earthshare' which is the bio productive area of the Earth divided by its total population. This concept is helpful in providing a comparison between the consumption patterns of the countries in the North and those in the South and helps to put in context the actions required in support of global inter generational equity and justice. The most recent literature on EF and universities is based on an Earthshare of 1.92 hectare/head of population (Flint, 2001; Griffiths, 2002; Venetoulis, 2002; and Dawe *et al*, in press).

A recent comparison of EFs derived from a number of universities and colleges highlights some of the issues (see Table 2; Dawe *et al*, in press).

University / College	Total EF (ha)	No. of Staff	No. of Students	Campus Area (ha)	EF/staff Member	Spatial Multiplier [†]	Proportion of Earthshare*	EF/Student
Newcastle, Australia ⁽¹⁾	3,211	2,200	17,000	135.00	1.46	23.79	0.76	0.19
Redlands, CA, USA ⁽²⁾	2,375	2,727	[no data]	133.50	0.87	17.79	0.45	[unknown]
Swansea (Univ. Wales) ⁽³⁾	10,004	2,316	10,314	19.66	4.32	508.85	2.25	0.97
East Anglia, UK ⁽⁴⁾	2,499	2,500 ⁺	13,000 ⁺	41.40	1.0	60.36	0.52	(est.) 0.19
Holme Lacy College ⁽⁵⁾	296	64	460	240.00	4.63	1.23	2.41	0.64
Oxford Brookes, UK ⁽⁶⁾	[no data]	[no data]	[no data]	[no data]	[no data]	[no data]	[no data]	0.22

Table 2 Ecological Footprint comparisons between some colleges and universities. Redlands analysis excluded food.

*This figure is based on earthshare being equal to 1.92 ha (as given in Chambers, Simmons and Wackernagel, 1996, pp. 150-151).

[†]Spatial multiplier is an estimate of how many more times the college/university land actually needed to cater for their EF actually is.

Sources: (1) from Flint, 2001; (2) from Venetoulis, 2001; (3) from Griffiths, 2002; (4) estimates supplied within Griffiths, 2002, and some figures (+) estimated by Mel Pascoe (pers. comm.); (5) from Vetter and Dawe, 2001 and this paper; (6) from Chambers, Simmons and Wackernagel, 2000.

Although the data available is limited it reveals the extent to which institutions are living beyond their ‘Earthshare’. In two cases the EF is more than twice the ‘Earthshare’ and might be even higher if the consumption patterns of all employees outside work hours were included (see Dawe *et al*, in press). Disaggregating the various components of the EF reveals that food, transport, waste and energy contribute by far the largest component of the footprint of an educational institution (Figure 1).

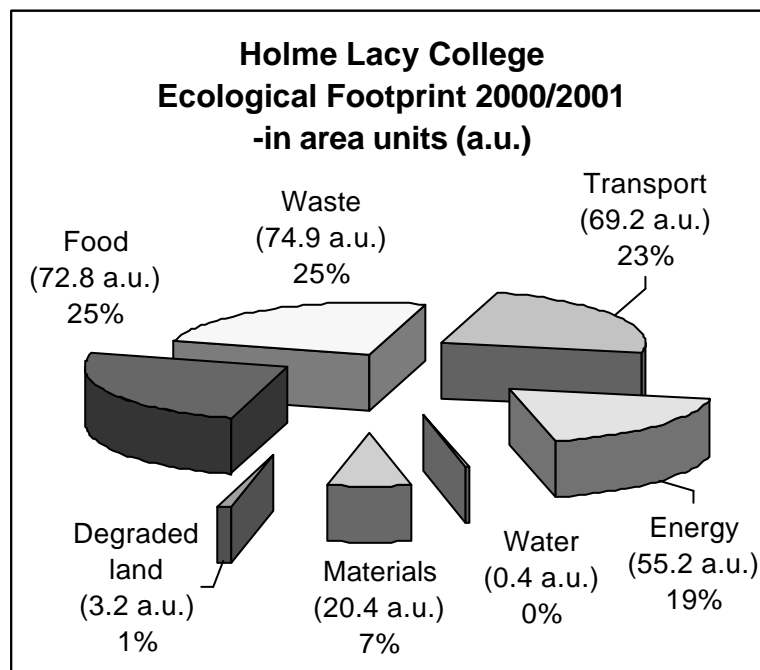


Figure 1 Holme Lacy College’s Ecological Footprint (EF) totalled 296.07 area units.

Education for Sustainable Development across the Curriculum

Universities also need to address the sustainability agenda through their curriculum. This is arguably a university's most important contribution to the sustainability agenda, but probably the least developed. There are a number of reasons why this has arisen. Sustainable development education has evolved as a process that is consistent with the holistic view of sustainable development. It has its roots in other cross-curricular themes such as environmental education, development education and education for citizenship. Recent debate centres on two contrasting approaches to curricula reform (Sterling, 2001). The first argues for the incorporation of sustainable development knowledge, skills and concepts into existing curricula, the second promotes the idea of changes in the concept and processes of education and learning as a whole. In short, the curriculum response to sustainability might be primarily piecemeal, affecting isolated parts of institutional practice, or systemic where whole system change becomes the agenda (Baines & Sterling, 2001). A recent study carried out as part of the EU Socrates Thematic network for Agriculture, Forestry, Aquaculture and the Environment (Bor *et al*, 2000) has identified some of the key issues institutions face in systemic change (Table 3).

i.	Integrating sustainability presupposes the rethinking of institutional missions
ii.	The imprecise nature of sustainability can be seen as an advantage in evoking dialogue on implications for curriculum, pedagogy, etc
iii.	Sustainability is complex. The concept touches all aspects of our existence, involves deep questions about human responsibility and destination, and can be seen at different levels from micro to global and through different perspectives. Therefore, curriculum review based on sustainability is essentially a holistic and interdisciplinary exercise.
iv.	Planning for sustainable development education will lead to questions about purpose, content and method and the role of teachers in the institution. It requires teachers to also see themselves as learners, and work with uncertainty and open outcomes.
v.	There is no blueprint for institutional and curriculum reform. Successful change depends on an inclusive and communicative process.

Table 3 Key challenges for educational institutions seeking to integrate sustainability concepts and practices.

In contrast to this analysis, much of the existing practice in universities in the UK can be summarized as follows:

- i. Much of the curriculum is discipline based and often highly technical and specialized
- ii. The impact of human activity on the environment is under represented in the university curriculum, except in the narrow context of health and safety
- iii. Curriculum change is largely driven by economic policy, which emphasizes vocational outcomes
- iv. Where sustainable development is taught it is not fully integrated as a core element

There are relatively few examples of a university tackling the curriculum issue in a systemic manner. Hawkesbury Agricultural College in Australia is widely regarded as one of the best-documented examples of developing an alternative curriculum. The Hawkesbury experience was a far-reaching and bold experiment, which developed an expanded view of the curriculum based on process and real world problems, rather than as prescribed content and set outcomes (Bawden, in Bor *et al*, 2000). The action research approach adopted is based on

a process by which knowledge is created through the transformation of experience. Such an approach needs students to be involved in experiencing real situations, which through appropriate thinking and planning, they could act upon. This approach is the basis of a number of new courses being piloted in the UK (see University College Worcester / Pershore Group of Colleges – Advocacy Programme, www.projectcarrot.org).

Conclusion

There is no question that universities need to embrace sustainability as urgently as the political and economic sectors and society as a whole. Undoubtedly, there is some good work already under way in the UK: the Environmental Association for Universities and Colleges (EAUC) has been a pioneering group in the UK, and Forum for the Future through its HEPS (Higher Education Partnership for Sustainability) programme. The funding councils are increasingly considering sustainability issues, partly as a result of pressures from bodies such as the Welsh Assembly. Some of the largest professional bodies have recently set up a Sustainability Alliance, which will put greater emphasis on the need to include sustainability criteria in their accreditation procedures for degree programmes. Some professional bodies are also including sustainability in their Charters.

What we really need is a review of the situation in the sector and a strategy to achieve effective change in mainstream educational thinking, policy and practice. We should not only determine where the sector is at present, but also engage as many institutions as possible in the review process, making sure that it is driven by their needs. A lot of expertise has been built up over the past decade, even though it might only be visible in small pockets of good practice. To multiply these efforts we need co-operation and partnership, not only between universities, but also with industry, local authorities and society at large. But this bottom-up approach has to be complemented by Government commitment to a sustainable university sector, and there is no better way of doing this than linking funding to performance measured against sustainability indicators. When ministers of education start to ask our Vice-Chancellors and Principals tough questions about sustainability, we might just stand a chance of making a difference to the education of our future leaders. Sustainable development needs to be at the core of the education system.

Key questions

1. What are the challenges facing universities in the context of Globalisation, the expansion of the European Union and the imperative of Sustainable Development?
2. What kind of professionals will universities need to produce?
3. How are universities performing currently with regard to this need for Earth literate leaders?
4. Are universities at the forefront of promoting Sustainable Development in all areas and through good practice?
5. What guiding principles are there for a sustainable university?
6. Are there useful measurement tools for sustainable universities?
7. What approaches towards curriculum are conducive to a sustainable university?
8. How do we best progress from the current unsatisfactory situation?

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