Through the (not so) Green Door: University campus greening and curriculum change

James Gray-Donald and David Selby

James Gray-Donald is Research Coordinator, Centre for Sustainable Futures, University of Plymouth, U.K. With David Selby, he has co-edited Green Frontiers: Environmental Educators Dancing Away from Mechanism (Rotterdam, Sense, forthcoming).
David Selby is Professor of Education for Sustainability and Director of the Centre for Sustainable Futures. His publications include: Weaving Connections: Educating for Peace, Social and Environmental Justice (Toronto, Sumach, 2000) and In the Global Classroom Book 1 and Book 2 (Toronto, Pippin, 1999, 2000).

Narrative

Wow! They actually want my opinion! What will I say? Am I qualified to redesign a building to be an exemplar of sustainability? Almost four years of studying architecture and practising being an environmentalist should do it. Yeah, I'll put a green roof on the north facing roof, solar PV shingled roof on the south side, that new vibration-less wind turbine that can go on buildings ... yeah energy self-sufficient and water too ... a grey water system feeding into a contemplative garden, waterless urinals, composting toilets, only local building materials, sustainably harvested wood, best insulation and triple paned argon gas filled windows, biodegradable paints, reused furniture ... it'll be great ... a building with almost no ecological footprint! Everyone will come to this building and see all the newest ideas at work! They'll learn that you can have a quality building that doesn't degrade the environment of future generations or rely on cheap materials from all over the world. We can show students it is possible to make a difference! Also it'll show the administration that they should do more of this; that sustainability makes sense and it saves money in the end ...

Introduction

"Higher education is the industrialized world's top industry ... [In American universities] ... enrolment exceeded 16,000,000 full- and part-time students supported by over 3,000,000 faculty and staff ... One study out of Georgetown University estimated the annual direct and indirect impacts of the American higher education industry at over US $1.2 trillion ... Colleges and universities are found in virtually every city of any size in every northern country, and many of these individual institutions are economic powerhouses in their own right ... Thus, while the university is an "industry" in the new knowledge economy, it is more than that because the specialists of most industries in this economy were trained at the university. In the knowledge economy it is literally the mother of all industries!" (M'GONIGLE and STARKE, 2006, pp. 35, 36, 97).

The Earth Summit, hosted in Rio de Janeiro in 1992, was a strong call for action towards sustainability at the highest governmental levels, and the early 1990s marked the writing of five major international declarations calling on universities to embrace the principles of sustainable development (UN, 1997; WRIGHT, 2004). The strong moral point that "given what academics know about the current ecological condition of the planet, there is an obligation for universities to become leaders in the movement to prevent global ecological collapse" (MOORE, 2005), is widely accepted. That more than one thousand university presidents and vice-chancellors have signed such declarations evidences a commitment, at least rhetorical, to sustainable development (WRIGHT, 2004; TILBURY, 2004).

The Global Higher Education Sustainability Partnership[1] is drawing together case-studies and publications from around the world (CALDER, 2006). Some clear trends are emerging from research into universities that have signed various sustainable development (SD) related charters. While a great number of universities have not progressed past the rhetorical stage, there are significant numbers who are making clear progress through new environmentally themed activities (SHRIBERG and TALLENT, 2003). There is a great deal of action to make university campuses more sustainable. The guiding principle is for universities to reduce their ecological footprints and be exemplars of best practice. The large annual Greening the Campus Conference in the USA and the annual conference of the Environmental Association for Universities and Colleges in the United Kingdom showcase success stories of energy efficiency, ecological building design, and other physical aspects of campus greening. Such initiatives are especially significant given the quotation by M'Gonigle and Starke (2006) that heads this section of the paper.

Yet despite over a decade of engagement in integrating the principles of SD into the university, research gives a picture of activity only happening in pockets, with no comprehensive action plan, no clear leadership and projects falling short of addressing the deep issues raised by a sustainability commitment (SHRIBERG and TALLENT, 2003). Indeed, of the action taken, most seems focused on campus greening while not engaging with the mode and content of the education offered within universities. Blewitt and Cullingford (2004, p. 1) rightly state that universities are "... no longer in the privileged position of simply observing, criticizing and evaluating what goes on beyond the seminar room or campus ... [because they take part] ... in both the production

of knowledge and wealth and the maintenance of poverty." Universities train the captains of industry; they produce the skilled labor force that pushes forward the growth economy; they have been key to the emergence of globalization – for better and for worse.

The assumption of many SD projects at universities seems to be that the transition to a greener campus, or one with a smaller ecological footprint, will lead, as it were, organically to a shift in the experience of students and staff and in turn to a shift in understandings and attitudes. If a campus is designed with due ecological mindfulness, then good ecological behaviors will presumably be modelled and internalized. However, this assumption has yet to be adequately tested by researchers. It is unclear whether gains in efficiency and reductions in ecological footprints of universities have had any significant impacts on staff and student experiences, and especially whether they are teaching and learning differently as a result. To be fair, curriculum reform within any educational institution is very difficult, particularly when the curriculum change involves a shift in the dominant worldview of science and society from our inherited mechanistic worldview to an emergent holistic or quantum science worldview (SELBY, 1999, forthcoming). It is much more manageable to work on physical, tangible changes in the campus and stay away from the political quagmire of curriculum change within higher education.

M'Gonigle and Starke (2006) persuasively argue that campus greening – and in particular regaining a local sense of place and learning to live within the limits and characteristics of the actual space of and around a university – is and will be a powerful force in reducing the ecological burden of cities, regions and countries. Is it possible to merge their vision with one in which the form and content of higher education also embraces the principles of sustainable development? Are we faced with a choice of either pushing forward solely campus greening or curriculum change or community outreach or social justice? Should universities continue to tackle these zones of engagement in isolation, and from within strict disciplinary boundaries? Or are there ways that these issues can be addressed holistically, as enfolded parts of the whole?

The authors of the present paper strongly believe that these issues can be addressed systemically and/or holistically and have been engaged in the first year of a five-year (2005-2010) project to transform the University of Plymouth.

This article briefly introduces and problematizes the term education for sustainable development (ESD) and explains the way the Centre for Sustainable Futures (CSF) interprets the term. The CSF model of university transformation and our pedagogy of sustainability are then presented. With this backcloth, we return to the question of campus greening and whether the University of Plymouth is, and will be, a green campus. The essential question is then addressed: how do you enfold campus within curriculum and curriculum within campus? In addressing the question, innovative interpretation modalities that are being piloted are presented. While CSF has been in the privileged position of a reasonably large capital budget, this is only for a short duration, and so the article continues by considering how to sustain campus change once funding for the CSF capital projects has been depleted. We also explain how we have planned our campus greening so that ESD may continue long after the funding has dried up. The article concludes by summarizing some future directions for CSF and the University of Plymouth.

What is Education for Sustainable Development (ESD)? The stance of the Centre for Sustainable Futures (CSF)

Sustainable development and its educational outcropping, ESD, are terms often heard within governmental, professional and academic arenas, yet they are terms for which there appears to be low public awareness (DARNTON, 2004). Amongst those engaging with the concepts on a regular basis, there is a preponderant tendency to recite and continue to work from and within the oft-quoted formulation, now 19 years old, of the Brundtland Commission report, *Our Common Future* (WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT, 1987). Sustainable development is there defined as "development that meets the needs of the present without compromising the ability of future generations to meet their needs" (WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT, 1987, p. 43). Key educational documents within the United Kingdom, including the *Sustainable Development in Higher Education: Strategic Statement and Action Plan* of the Higher Education Funding Council of England (HEFCE, 2005) continue to frame their proposals for ESD within the Brundtland articulation, disregarding critiques that it overly lends itself to corporate appropriation and government growth priorities by implicitly calling for "the conservation of development, not the conservation of nature" (SACHS, 1995, p. 434), and so orienting the field in its mainstream expressions away from conceptions of sustainability directly invoking bioregionalism, decentralization, self-sufficiency, direct participatory democracy and the centrality of nature to human well-being (SELBY, 2006).

So what should ESD be in a university? Should it work within now standard definitions or should it be presented as contested space? Should it work within government frames or allow for the bubbling upwards of grassroots, alternative conceptions? Should it be seen as a new specialization or a trans-disciplinary gathering space?

The Centre for Sustainable Futures (CSF) at the University of Plymouth opened on 1 June 2005 following a successful bid by a group of academics representing several disciplines (architecture, biological science, civil engineering, education, environmental science, geography, and law) to HEFCE for initial capital and five-year recurrent funding for a Centre in Excellence in Teaching and Learning: Education for Sustainable Development (CETL ESD).

The goal of CSF, as laid out in the bid document, is "to transform the University of Plymouth from an institution characterized by significant areas of excellence in Education for Sustainable Development (ESD) to an institution modelling university-wide excellence and, hence, able to make a major contribution to ESD regionally, nationally and internationally" (DYER and SELBY, 2004, p. 1). To that end, a core staff of seven was appointed (Director, Deputy Director, Reader, research team of three, Centre Manager and Administrative Assistant), arrangements were made for the partial buy-out of academics as affiliated Centre Fellows on an annual basis (there are 24 Fellows in 2006/7), and, as touched upon below, partnerships were forged with internationally-regarded bodies promoting sustainability; namely, Schumacher College[2] and Forum for the Future.[3]

In its transformative intent, CSF has chosen to project ESD as a messy, contested space involving a dynamic tension between reformist and transformative conceptions of sustainability, and between philosophical and practical emphases. On the one hand CSF is working within reformist definitions and frameworks embraced by governmental and government-affiliated bodies; for instance, the concept of "sustainability literacy," i.e. developing the skills and knowledge for proactive professional engagement with sustainable development, as advocated by one partner, Forum for the Future (PARKIN et al., 2004). On the other hand, CSF's partnerships with Schumacher College, with its transformative and biocentric sustainability agenda, as well as with grassroots organizations and networks in the South West of England offer fertile space for countercultural, transgressive thinking and change initiatives. The Director of CSF has offered a root and branch critique of dominant conceptions of ESD in a recent publication (SELBY, 2006).
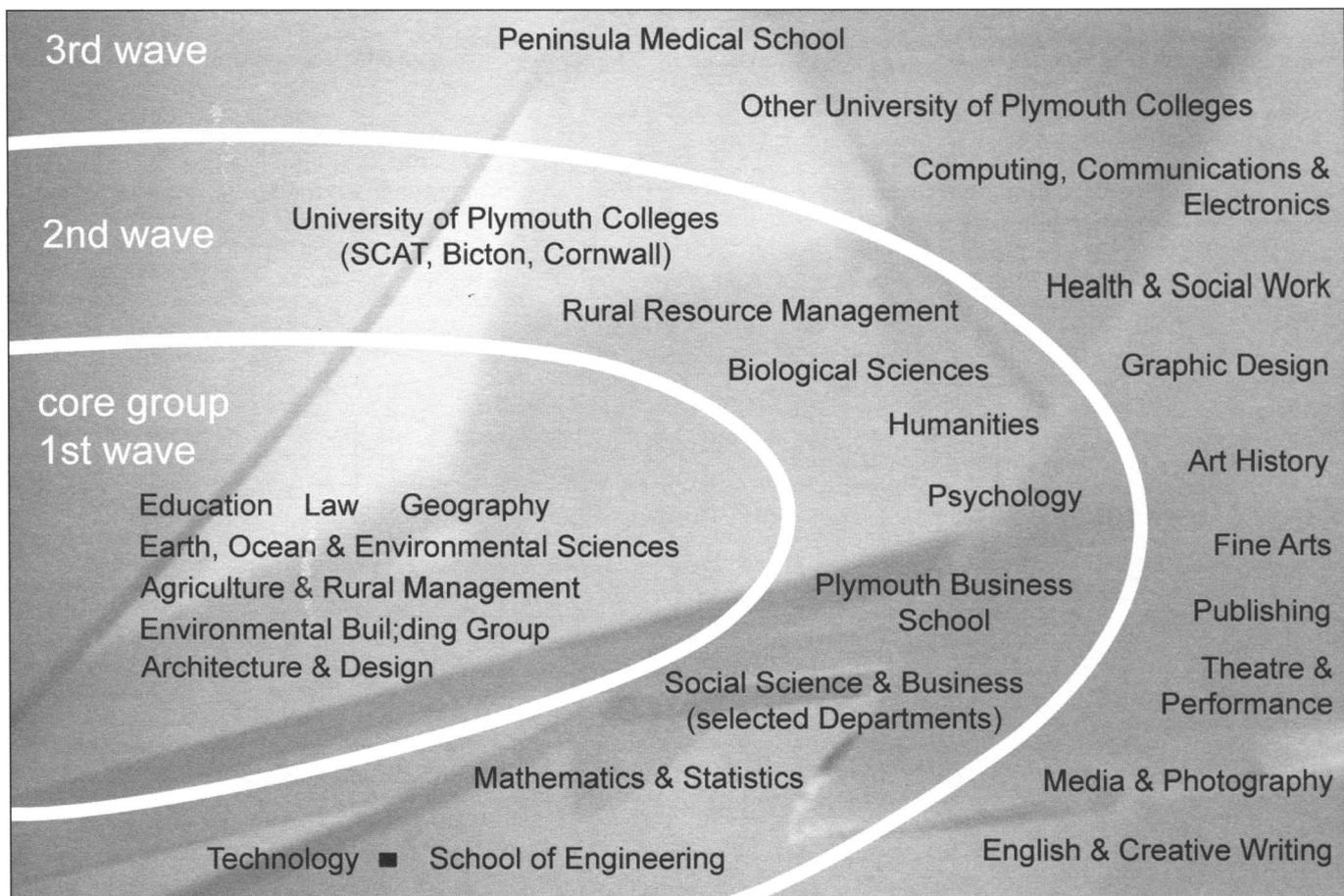
Fig. 1: Initial thinking on how the "ripple effect" might happen, locating other schools and faculties in either a "second" or "third wave" according to their likely amenability to engaging with ESD.

It would seem to chime with academic culture and expectations, and thus be more likely to optimize receptivity amongst the academic community, to convey ESD as contested, even, in broad terms, desirable. Such a stance allows for academics of different disciplines to focus on the philosophical or downright practical, as they see fit. Also, by not closing down the parameters of the area and by constantly questioning the prevailing predominance of environmental and economic dimensions of sustainability, space is always being recreated for consideration of aesthetic, cultural, health and social justice dimensions, thereby opening up the appeal of ESD to schools and faculties that might otherwise not see its immediate connection to their spheres of concern.

In seeking to effect transformation, there are process benefits in vagueness. As Wals and Bawden (2005, p. 38) argue, under a sub-heading, "It is no use crying over vague definitions," vagueness in defining ESD "has enormous canvassing and heuristic capacity if it is systematically used as a starting point or operational device to exchange views and ideas. These ongoing discussions may generate fruitful working hypotheses for the concrete formulation of curricula, study programmes, subject matter content and didactical arrangements."

CSF is conceived of as a gathering place, a strange attractor (CAPRA, 1996, pp. 131-134), where academics of different disciplines come together and explore similarities within differences and differences within similarities around a nebulous but common set of sustainability values as they work on their own or shared, but always connected, initiatives. The potential for transformation, it is felt, is thereby enhanced.

The CSF model of university transformation

In the bidding process with HEFCE, the Plymouth team had to demonstrate already-existing excellence in ESD curriculum and pedagogical development. Those "excellent" faculties and schools from which the team was drawn became the "first wave" areas (fig. 1) with which CSF has worked to "widen and deepen" excellence. The bidding team, in effect, comprised the first (2005/6) group of affiliated Centre Fellows tasked with undertaking curriculum development within both the undergraduate and graduate program provision of their own school or faculty, and drawing colleagues into the initiative through formal and non-formal processes of continuing professional development (CPD). The curriculum development might involve the development of entirely new programs or it might be "infusionist" in nature, i.e. involving the exploitation of thematic windows of opportunity for embedding ESD within existing programs. A key "first wave" aim has been to build levels of collegiality and cooperation within the team on the one hand, and capacities in curriculum development, CPD facilitation, and change agency/advocacy on the other, so that CSF would be both equipped and positioned to engender a "ripple effect" across the institution through core and affiliated staff engaging in university-wide dissemination and change initiatives.

The wave diagram (fig.1) is taken from the bid document and represents initial thinking on how the "ripple effect" might happen, locating other schools and faculties in either a "second" or
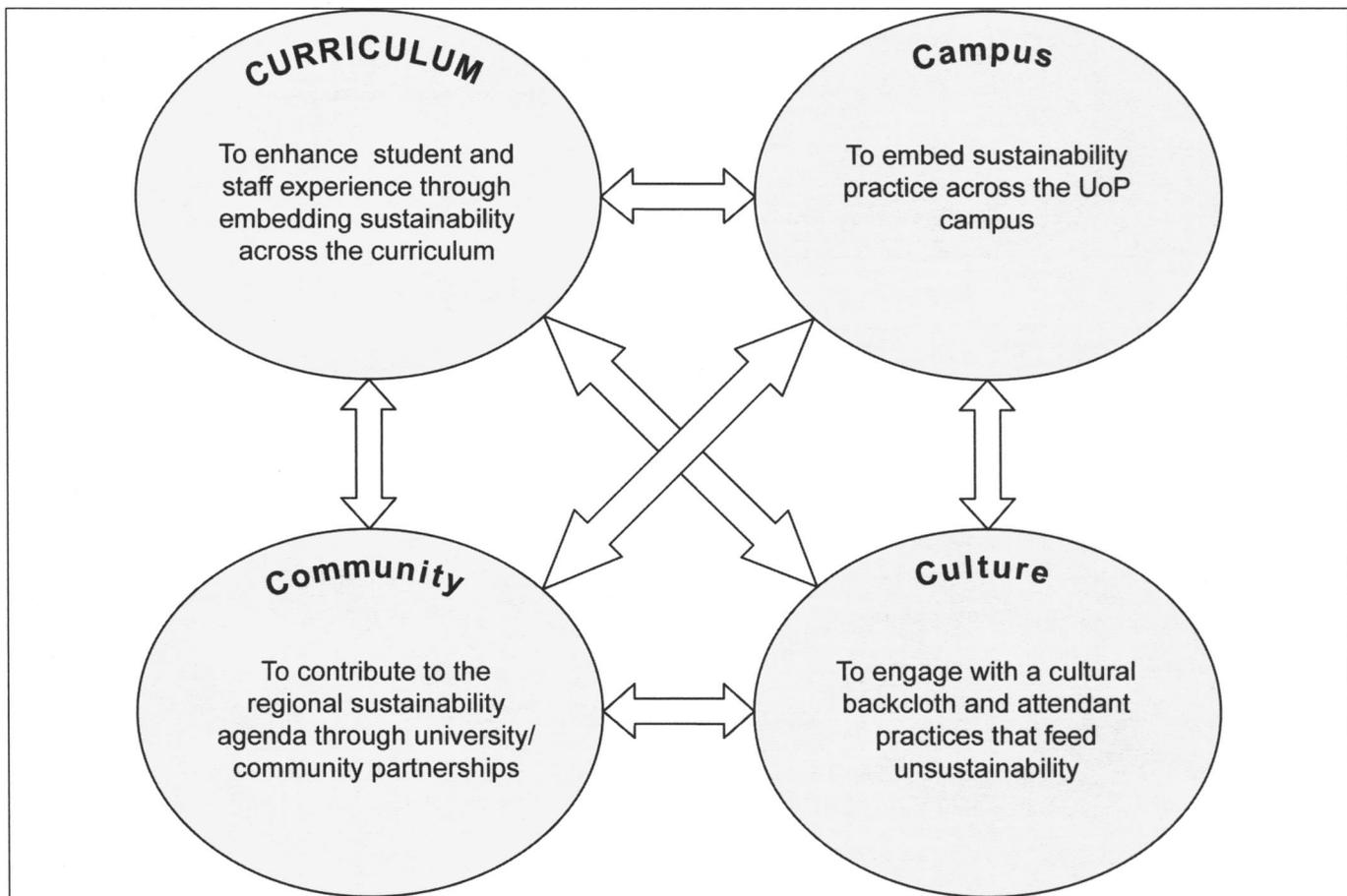
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Fig. 2: The Centre for Sustainable Futures is working to a Four "C" model for transformation.

"third wave" according to their likely amenability to engaging with ESD. In retrospect, there was an element of stereotyping in the allocation to waves, in that some schools and faculties that were regarded as less amenable and hence placed in the "third wave," have been found to harbor rich seams of sustainability-oriented learning and teaching practice and have been impatient to join the initiative. Computing, Communications and Electronics, and Graphic Design are cases in point, joining the initiative as pioneer members of the "second wave" for the 2006/7 academic year, and appointing Centre Fellows.

CSF is working to a Four "C" model for transformation (fig. 2). The approach is systemic, and predicated upon an understanding of the radical interconnectedness of processes of curriculum change, campus development and community engagement in embedding sustainability across the university, and the correlative need to recognize, name and work upon the status quo-reinforcing cultural backcloth of assumptions, perspectives and practices that feed and bolster unsustainability.

Woven through the model is the importance of research. The University of Plymouth 2004-2009 Corporate Plan (2004, pp. 4 and 5) identifies research into "economic, social and environmental sustainability" as one of "four strategic priority areas" where "research investment will be strategically concentrated." In line with this priority, CSF has a pedagogical and institutional research team that is researching processes of change under the curriculum, campus, community, and culture headings so that approaches, initiatives and strategies are, with cumulative effect, research-informed.

The nine identified research strands providing a framework for CSF research activities are:

• Starting and evolving perceptions of University academic and support staff;
• Threshold and evolving student attitudes and worldviews (including student narratives of engagement with sustainability);
• The dynamics and trajectory of CSF as a project;
• Curriculum impacts, including student actions projects on campus and in communities;
• Institutional change/transformation;
• Community partnerships and impacts;
• Wider (national and international) partnerships and impacts;
• Pedagogical research; and
• Theoretical research.

A CSF meta-research group meets half-yearly to review all research outputs, explore their change and development implications, and recommend how, in concrete terms, approaches toward the curriculum, campus, community and culture might be accordingly refocused and steered in new directions.

Is there a pedagogy of sustainability?

Sustainability not only encompasses ecological mindfulness and associated competences, but also equity, social justice, health, a peace ethic, and participatory action for change or transformation at multiple levels, personal through global. If we are to establish congruence between "message" (what we learn and teach) and "medium" (how we learn and teach), these principles weight the pedagogy towards:

• A learner-centered (horizontal) dynamic as against a teacher-centered (transmissive or vertical) dynamic, with an accent on

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experiential discovery learning;
- A real issues orientation and engagement within the learning process that develops skills, capacities and understandings in real life situations;
- Praxis-oriented learning (a dynamical linking of theory and practice achieved through interweaving hands-on and second-hand or surrogate, media-channelled experience);
- Embracing socio-affective and skills-related objectives as well as cognitive objectives;
- Enabling students to listen to the voice of the countercultural and marginalized (respectively, those opposed to and those harmed by unsustainable modes of living and relating).

The notion of "eco-design" is important in this regard. In *The Hidden Connections* (2003), Fritjof Capra argues that a key dimension in achieving sustainability in any walk of life, including education, is to design human endeavors according to the principles of ecology. Ecoliteracy, that is, understanding and applying "the principles of organization that ecosystems have evolved to sustain the web of life" is "the first step on the road to sustainability" (CAPRA, 2003, p. 203). This suggests that learning and teaching should be informed by processes of partnership, co-adaptation, networking, multi-directional energy flows, diversity, a synergistic interplay between an individual's inner and outer self, and a tensile dynamic between the assertive and integrative tendencies in members of a learning community (SELBY, 2000, pp. 90-91).

The implications of a pedagogy of sustainability are that learning should spill out of the classroom and into the campus and community. The interlinking of curriculum, campus and community enables students to become engaged in action learning in multiple arenas, with the classroom housing: initial sharing and framings of theoretical and personal understandings, subsequent dialogue and reflection on actual experiences "in the field," a revisiting of theory in the light of what emerges, and the consequent informing of further action learning plans.

The fourth "C," culture, also has a key place in the learning process. As Rohwedder (2004) has pointed out, there is a "pedagogy of place," a hidden learning agenda from the built and landscaped surroundings of a university that seeps subliminally into the learner. That agenda on most campuses is about reductionism (the separation into disciplines by buildings and floors of buildings), the paucity of architectural cross-disciplinary interface, the application of the metaphor of factory to all university spaces, and a drawbridge paradigm (i.e. lack of shared meeting space with the larger community). An important aspect of a pedagogy of sustainability is an exposing and challenging of the hidden agenda. As Rohwedder (2004, p. 297) puts it: "If the design and

operation of our facilities don't fully exemplify the fundamental aspirations of the lessons we are seeking to impart, what then is the message that we convey to our students? If our students and fellow colleagues can't see clearly manifested on our campuses the principles of sustainability that we hope to see boldly adopted by all of society, then how can we ever expect our students to carry this vision forward?"

Narrative

Wait, why is our lecturer stopping here? You mean this ugly building? The old derelict one that will be in the shadow of the soon to be built four-to-seven story Faculty of Education building? But the roof doesn't face south ... but there will be almost no wind ... wait we can't go in? The first floor may collapse? It needs the ground floor to be dug up and replaced? Additional steel support beams to keep the first floor from falling through?

How are we supposed to show that another world is possible if most of the budget for the building has to go into structural work? I'm confused. What sustainability features will we be able to show to visitors? I thought this would be like the new building at the Eden Project.[4] Where is the "wow" factor?

Hold on. Why am I stuck on appearances? Is there something deeper going on here? I think the real world just crept into my course. I think I just learnt that most design and construction projects I work on won't be sexy flagships of sustainability. Am I disappointed? Well, no actually, I think I like the challenge of having to be creative and engage with all the "normal" builders and architects out there. And I have a few ideas already looking at this old thing. Maybe just the fact of conserving an old building and therefore not needing new materials is a pretty big deal, and I think the window frames are wide enough that the old single paned glass can be removed and double paned glass with a top U rating can be put into the same wood of the window frames. Almost no waste! Now that front door needs replacing, a perfect spot to put in lots of well insulated glass and show off a local, sustainably-harvested, wood door frame. Ok what else ...?

Is the University of Plymouth a "green" campus?

The University of Plymouth only officially opened in 1992 after a 22-year period as a polytechnic and more than 70 years as a site of post secondary learning. The university has been divided across four campuses, with each one having a different focus dating back to its days as a polytechnic. The current Vice-Chancellor is overseeing a process of centralization with the gradual integration of all schools, staff and students onto the main Plymouth campus. The consolidation of four campuses into one downtown urban campus, as well as a growing student population, has led to the creation of a number of new large buildings with several more on the way.

One result of the urban nature of the campus and its growth through consolidation is a severe lack of green space. Figure 3 shows nearly half of the largest green space on campus, though a major road is located right behind it. While the campus may not win awards for aesthetics or green design, it is at the forefront of energy and water efficiency. There is also a lack of in-

Fig. 3: Almost half of the largest green space on campus.

formal meeting space, and a near absence of outdoor contemplative spaces. While the university is centrally located beside the shopping district, local residents do not feel welcome on the campus and will even make a detour to avoid walking through the campus.

The short answer to the question posed in the section heading is "no." While personally committed to ecological sustainability, a member of Estate Planning agrees with the consensus that the University of Plymouth does not have a green campus, that its buildings are not exemplars of sustainability, and that it will not have such buildings in the near future. The University has not won awards or media attention for any buildings that push the envelope of environmental design. Interestingly, the member of Estate Planning states, "I do not think that the awards for most sustainable buildings should go to the grand designs, for the architectural wonders ... because such buildings do not have to engage with the way the construction industry operates. The award should go to a company that makes a change to the way it builds its ordinary projects. For example, a company that decides to put solar PV panels on all its new housing starts." This is the challenge: to engage with the way the construction industry and estate planning divisions operate and integrate sustainability into the regular operations beyond a single special project.

Currently, the University is composed of independent building projects in close proximity that were designed and built by different companies with little or no concern for anything beyond basic functionality, time and cost. Figure 4 is an example of the uninspired architecture and lack of green space.

Figure 5 shows the conceptual overlap of the CSF campus strategy. Greening the campus is only one of the three overlapping ideas. Of equal or greater importance is to improve the transparency of the campus change process with the empowered inclusion of students, and to incorporate meaningful (as opposed to just rhetorical) changes to institutional policies and practices bearing upon campus change. CSF was left holding a few cards to move our strategy forward when we were awarded just under US$5 million for capital projects, which had to be spent in two years.

The underlying principle of all the CSF capital spend projects was to bring ESD, and not just sustainable development, onto the campus. Physically manifesting ESD has clearly meant taking steps towards becoming a greener campus, but only as the outcome of a deep process of engagement around the educational qualities of the buildings and landscape. Instead of asking contractors and architects to build the greenest possible buildings, they have been asked to participate in a process of consultation with staff and students and challenged to design and build things of educational value. Surprisingly, the University had never before asked its building contractors, architects and landscapers to consider the educational value of their work and how it might fit into the wider institutional mandate of providing a high-quality learning experience for students. Previously the University's idea of a successful building was one that was delivered on budget, on time. CSF, because it was holding the funds and had the full support of most senior administration, only approved of projects when we were satisfied that the project would help promote the teaching and learning of sustainable development. Indeed that is the whole point of the CSF project and a reference point to which we keep returning.

While there is not enough space to describe all of the CSF capital projects, we will sketch one example for illustrative purposes. When the whole CSF project was just starting, the new Student Union building was in its final design stage and there was a reasonably sized outdoor area adjacent to it that was going to be left empty and paved over. CSF spoke with the Student Union representatives and it was decided that a range of landscaping options would be drawn up based on agreed upon principles and then the Student Union would be consulted as to which plan was

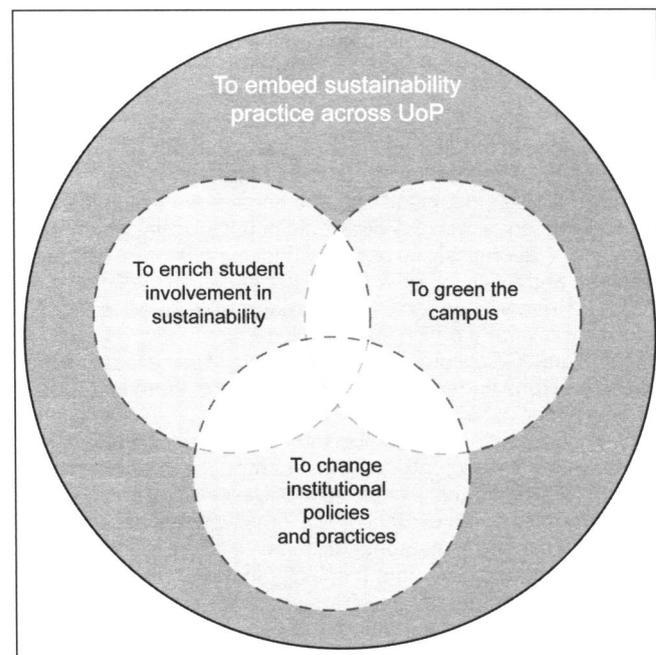**Fig. 4:** An example of the less-than-inspiring architecture and lack of green space.

Fig. 5: The conceptual overlap of the CSF campus strategy.

best. To our initial shock, the plan with the least green space was chosen by the students. Upon asking why this was the favored option they stated that most of the time when students are on campus, the ground is wet due to rain; so informal meeting space was a higher priority than dedicated green space. Furthermore the least "green" design included a small stage on the side of one building with a common area in front with slowly terraced steps/levels such that a natural amphitheater was created. This offered a suitable environment for performances and protests that did not previously exist on campus. Therefore, by listening to the students, we were able to address a much needed social dimension of sustainability. The ecological dimension was not neglected however, as several biology lecturers and students took on the responsibility of choosing the species to be planted in the few green spaces with a conscious effort placed on increasing the biodiversity and showcasing resilient species suitable to that environment. The whole design process is being documented

and will be made available through interactive panels in that specific location.

Enfolding campus within curriculum and curriculum within campus

In seeking to make campus and curriculum mutually enfolded dimensions of students' sustainability experience, a range of approaches are being employed.

● **First**, opportunities are being capitalized upon within undergraduate and graduate programs for students to engage collaboratively in taking forward and evaluating campus greening processes. This can occur within modules or, more substantively, by making an aspect of campus the focus of an end-of-program dissertation. Within modules and for their dissertation work, students have already:

• Contributed to building retrofitting and landscaping projects;
• Identified and analyzed the energy efficiency of University buildings using the CSF thermal imaging camera (the only such camera not in military hands within the United Kingdom!), making recommendations to University Estates for remedial action;
• Researched, designed and negotiated the indigenous planting of University green areas;
• Investigated (as per the narrative woven into this article) environmental standards in the CSF building; recommending, and seeing installed, additional sustainability features;
• Collected and analyzed data on the sustainability record of different University buildings and, employing innovative information technology modalities, brought their findings to public attention;
• Participated in co-designing the new Student Union garden, a design process involving architecture and landscaping students in building a covered area for social events and a Sustainability Speakers' Corner, as well as biology students considering appropriate planting and biodiversity aspects; and,
• Designed and established the CSF website which, unlike the rest of the University, uses free, open-source software allowing for ongoing dialogue around sustainability issues.

As a Senior Lecturer in Architecture put it:

"This is not just a building project; this is about education for sustainability. And the bottom line has always been (about) supporting students and staff in the University … and understanding better what is going on here, both at the social level and (through) the creation of spaces which are actually positive, socially and culturally as well as environmentally enriching … but that education basis is fundamental."

Capital monies have been set aside for students from a range of schools – Design, Graphic Design, Media and Photography, Theatre and Performance, and English and Creative Writing – to participate in the co-design and co-development of a proposed one-mile walk through time linking the city center to campus. Beginning on the famed Plymouth Hoe, city residents and visitors, staff and students, will be able to visit, one by one, interactive electronic sites exploring geological and historical time, ending with the exploration of probable and possible futures for humankind and the planet. At several points on the campus, sites will invite students, staff and visitors to enter buildings to view digital displays, presentations, art and artefact exhibits, and films on sustainability-related themes and issues.

● **Second**, efforts are being made to embed campus (and community) engagement in more systematic ways through the writing or rewriting of programs and rules and regulations. Hence, the new Masters in Learning for Sustainability involves students in "immersion experiences" as a core part of the program, in which students engage with "sustainable learning communities" on or off campus, reflecting on their experiences through the lenses of the three modules per term. Other sustainability-related Masters courses are similarly involving sustainability placements with on or off campus communities built into their curriculum requirements. The intention of CSF, as laid down in the bid document, is to be able to provide opportunities for all students, so wishing, to engage in sustainability-related action research by 2010. In support of this goal, consultations are in process with a view to building sustainability criteria into the revision of the University *Learning and Teaching Strategy*, into the student personal development profiling system (a process whereby the skills development of each student is periodically self-evaluated with a tutor) and into course approval procedures. Also significant in this regard is a proposal, current as we write, making it mandatory for students and staff undertaking research with any on-campus or off-campus community to offer evidence that they have engaged the community in discussion of their findings. In this way a feedback loop is created, with less likelihood of research "subjects" left feeling that they are, yet again, the forsaken guinea pigs of the University research imperative.

● **Third**, exciting, innovative and interactive multi-media interpretation modalities are being developed so that future generations of students will be able to explore and learn from the thinking and processes shaping successive campus changes. The modalities will:

• Describe and explain the building, design, and landscaping decisions made, articulating the opportunities, constraints and alternatives with which those involved were confronted, and the strengths and weaknesses of the final outcome;
• Feature consultative processes and the processes of engagement of diverse stakeholders, together with their retrospective reflections; and,
• Provide for the input of, and new interpretative displays by, future waves of students from different disciplines, and encourage re-evaluations of the technical aspects of the building or landscaping development.

According to a member of the CSF campus committee, a key element of the "work that will be shown [is that it] will actually be created by students about the old project, so that, for example, architecture students might actually be asked to look at the history of the particular building that was developed and about its sustainability issues."

Supported by a fairly modest capital spend, staff and students of the Institute of Digital Art and Technology (I-DAT) in the School of Computing, Communications and Electronics, are to take up the challenge of using digital systems (involving hardware and software development) to meet campus sustainability interpretation requirements and student, staff and visitor on-campus formal and informal learning. Projects slated for completion in 2006/7 include:

● **A Waterfall Project:** An animated digital waterfall interpreting water usage on the University's Portland Square Building. In this water feature the width and scale of the waterfall will depend upon how much water the building is using in real-time. If a great deal of water is being drawn from taps, toilets and kitchens the waterfall will grow in volume and represent the powerful draw on resources a community as large as the occupants of Portland Square has upon the water supply. As the demand for water drops, the waterfall shrinks and returns to a pleasant flow. (It should be noted that, at the time of writing, the I-DAT community is debating turning the concept around so that a waterfall trickle symbolizes overuse).

● **Immersion Vision Theatre Roof:** Digitalizing the outside of the half-globe roof of the University Planetarium so that it can convey ever-changing images of and information about global weather patterns, resource use, population trends, global warming and so on, or, alternatively, live data streams on University energy and waste performance, or, indeed, the same images

from around the world that are viewable within the Planetarium.

● **Digital Sustainability Wall:** A wall offering information on latest staff and student research into sustainability-related issues, live presentations, live data streams on the University's sustainability performance, and notice of new initiatives and upcoming events.

Those behind these initiatives recognize that knowledge of sustainability does not necessarily lead to individual or community behavioral modifications, but direct and continuous feedback on the consequences of behaviors in easily digested form can more easily have that effect (SPEED and PHILLIPS, 2006). Such direct and continuous feedback is achievable using the internal and external surfaces of buildings on a campus.

Sustaining campus change and ESD on campus

In a large university with 23,000+ students such as the University of Plymouth, a US$5 million infusion into the capital spend/infrastructure is very small. It is quite easy to foresee that money being spent and then the university returning to business as usual and forgetting about ESD or even SD in its further campus developments. Therefore, the success of our capital spend will not solely be measured by the reduced ecological footprint of the University, but also by the degree of democratic engagement of diverse stakeholders (including students) in the ever-continuing campus change process. The continuance of that process after the funding runs out is a key indicator of success.

With the goal of sustaining campus change around principles of ESD, CSF has consciously created formal and informal spaces of dialogue for people from different areas of the University. Estates managers rarely interacted with lecturing staff in the School of Architecture, who, in turn, rarely spoke with colleagues in the School of Engineering (with its renowned program in environmental construction), who rarely spoke to the Student Union, while the Environment Committee felt frustrated because its voice was not being heard and action was not being taken on their recommendations. Through the use of its funds for the new capital projects, CSF has reinvigorated the Environment Committee, which is now chaired by a senior representative of Chancellery, and its recommendations are now being acted upon. CSF has also created a Campus Forum with representatives from procurement, estates, schools and faculties, and the student body regularly engaging in eye-opening discussions that are not taking place elsewhere. In essence, CSF has created and helped legitimize spaces for rich dialogue and creative conflict, and opened conduits for innovative ideas to reach the higher levels of the University administration in non-threatening ways. A member of the CSF campus committee recounts such a story:

"During the November discussions that we held at Schumacher, on the day we had the Estates and various other people with us we had short meetings, talking in small break-out groups. One of which included somebody who is responsible for all the teaching space; the sort of person who is the ground support of all the teaching spaces in the university. And there were lecturers and students in the group as well. There was a short discussion at which point he was completely astonished to find that some of the lecturing spaces in the university were actually more successful as teaching spaces than other teaching spaces. And he was really interested to find out why that was; whether it was to do with lighting or the acoustics, or the size of the room. There was discussion about the lecture theatres relating to where you could have different formats for teaching.

And it was really very engaging to find that the Estates people were really keen to make these spaces as good as they could be. And yet that had clearly never been part of their brief in terms of what they were tasked to achieve at the University. And that's

rather surprising I suppose, but very odd."

The maintenance of open, yet purposeful, spaces of dialogue between disciplines and across institutional roles is key to sustaining a culture of learning and creativity around campus greening and its connection to ESD.

The continuation of CSF can be viewed in two ways. One is to say that if it is successful it will be funded for the next 25 or more years. Another is to say that it is very successful if at the end of project there is no need for it! This latter notion of CSF weaving processes of ESD into the very fabric of the University such that there is no need for a separate Centre is both very ambitious and very appealing. Ephemerality and sustainability, it has been suggested, are, after all, concepts in dynamic interplay, a dynamical, dancing unity of opposites (SELBY, 2006, pp. 362-363).

Narrative

Well this is a party! Kids playing percussion with old steel drums, plastic bins and broom handles, the deputy Vice-Chancellor whizzing around on a Segway scooter, lots of people and even the sun came out for the opening day. The building still looks a bit grey and uninspiring for a Centre for Sustainable Futures, but I know that the building embodies sustainability. The University even took on my recommendations ... I mean those of my class. They replaced the glass in the windows while keeping the original frames. They used non-toxic biodegradable paints, recycled carpets, they asked the suppliers to use sustainably-harvested wood. There was almost no waste and there's lots of space now devoted to studying and teaching sustainability.

I'm still angry about this door though. How could they? Estates asked for sustainability certificates and they were told "no problem." We asked to see them and were sent a pile of faxes that in the end meant the suppliers were allowed to sell Forest Stewardship Council approved wood. But did they? They wouldn't say. There was a loud silence. So we asked the UK Timber Trade Federation about it and they said that the wood in our door, Koto, is West African and that only one company is certified there. We Googled them, and one of the top hits was Greenpeace with pictures of that company logging illegally in a national park! The best I can guess, the doorway to the sustainable future is lined with the habitat of endangered species from Africa ... This did make people perk up though, we found another company that does follow all the sustainability standards, is competitively priced and can supply the University. It should be University policy soon to only allow FSC wood that has been milled according to ISO 14,000 to be bought here. Maybe another world is possible ...

Future directions

The campus does not have to look green to be sustainable or to promote commitment to sustainable lifestyles among staff and graduates. Equally important in fomenting a sustainability ethic, it has been suggested, are using open and inclusive processes of consultation; working with holistic understandings of sustainability that also give center stage to social justice, health and peace dimensions; embedding sustainability issues in the curriculum and providing students with opportunities for engaging with those issues within real life situations; employing a partici-

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patory pedagogy; utilizing campus assets to interpret the campus environment through sustainability lenses; and giving immediate feedback to the campus community on its sustainability performance.

As we write, we look forward to a 2006/7 academic year when, among others, the following initiatives are planned or proposed:

● The development of a graduate culture around sustainability through weekly workshop gatherings of Masters students together with doctoral students on sustainability-related programs, where participants will be challenged by various disciplinary and ideological takes on sustainability;

● Staff/student engagement with University procurement officers to build sustainability criteria into procurement practices;

● Staff/student engagement, especially through the Business School (whose students run an alternative organic restaurant), with University catering services to introduce locally-produced and organic food, with the active support of the Slow Food movement[5];

● The introduction of elements of gift economy into the University, so that, for instance, students might waive part of their fees by contributing time and labor to campus sustainability efforts, or a local non-governmental organization might use campus facilities in return for an in-kind sustainability input.

Narrative

Graduation. What does the future hold for me? Where will I go? I would like to challenge people with the buildings I design, challenge my fellow architects to integrate sustainability into the way they think about design, to show big construction companies that good design with lots of public consultation may cost a bit more, but it delivers much better value and lower maintenance costs.

Wait, what is this big interpretive panel outside the Centre? "Welcome to the (not so) Green Door." What are they doing? Are they crazy to tell everyone that this door isn't sustainable? Oh, I get it. They are using the door itself as a gateway to show people the learning process embedded within the building, within the process of decision-making about renovating it, about how institutional change happens, about how it took a bunch of aware, articulate and persistent people to change the momentum and direction of a university, about how a building does not have to be an exemplar of sustainability to be an exemplar of learning and teaching about sustainability. Maybe even the intangibles of policy change are more significant than the stand-alone success of a sustainable building ...

Notes

1. "Four international organisations with a strong commitment to making sustainability a major focus of higher education have formed a 'Global Higher Education for Sustainability Partnership (GHESP).' The four founding partners of the initiative the International Association of Universities (IAU), the University Leaders for a Sustainable Future (ULSF), COPERNICUS-CAMPUS and UNESCO combine forces in a unique effort to mobilise universities and higher education institutions to support sustainable development in response to Chapter 36 of Agenda 21." Accessed on 21 August, 2006 at http://www.unesco.org/iau/sd/sd_ghesp.html.
2. Schumacher College is located at Dartington, Totnes, Devon. It describes itself as "An international centre educating and inspiring for sustainability." Accessed on 1 August, 2006 at www.schumachercollege.org.uk.
3. Forum for the Future, in its own words, "is recognised as the UK's lead-ing sustainable development charity. Our mission is to accelerate the transition to a sustainable way of life. It is one we share with partners drawn from business, finance, local authorities, regional bodies and higher education." Accessed on 1 August, 2006 at www.forumforthe-future.org.uk.
4. The Eden Project is located in Cornwall, UK, on the site of a former open pit mine. The area was reclaimed and is now a horticulturalist's dream and the region's greatest tourist attraction. The Eden Project just finished building a new education center. In their words "The building is a model of sustainability. The structure is a network of double-curved beams from Forestry Stewardship Council-sourced spruce from Switzerland. The copper for the roof panels comes from a single source – a Rio Tinto-owned mine near Salt Lake City, Utah. The wall tiles are made of Devon clay and are decorated with the handprints of visitors who helped make them." Accessed on 1 August, 2006 at http://www.edenproject.com/about/2172.html.
5. "Slow Food, founded in 1986, is an international organization whose aim is to protect the pleasures of the table from the homogenization of modern fast food and life." Quoted from http://www.slowfood.com/ (accessed on 1 August, 2006).

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