

Even More Sense and Sustainability: a review essay

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Sense & Sustainability: Educating for a circular economy. Ken Webster & Craig Johnson, 2010 <http://www.ellenmacarthurfoundation.org/education/publications#pubsub> Accessed July 5th 2011.

In this essay I intend to review the core text that underpins the work of the education team at the Ellen MacArthur Foundation (<http://www.ellenmacarthurfoundation.org/>). I will show that while it is strong on some technical aspects of sustainability literacy it is seriously deficient with regard to critical aspects. Suggestions will be made as to how this deficiency might be remedied.

I should perhaps start by acknowledging that I have known Ken Webster and Craig Johnson for many years. Ken and I worked together on *Reaching Out*, WWF's programme of continuing professional development for teachers, in the 1990s (Huckle, 1998). Earlier I had worked with Craig, then a WWF education officer, on curriculum development projects, including *What We Consume* (Huckle, 1988a). Ken's ability to engage teachers with new and challenging ideas in ways that capture their interest and prompt change in the classroom is an inspiration to fellow writers and workshop facilitators. Craig was a key member of a strong WWF team led by Peter Martin that did much to steer environmental education towards ESD.

A continuing creative tension in *Reaching Out* courses was that between Ken's approach based in an ecological worldview, systems thinking and new economics, and my approach based on political ecology, critical theory and eco-socialism. While Ken wished to re-orientate systems of thinking, production and education in line with ecological principles, I wished to re-orientate systems of production, governance and education in line with principles of democracy in the belief that ecological principles would be likely to follow. Our views were, and remain, partly contesting and partly complementary and Ken's recent work provides an opportunity to examine this tension in greater depth.

A new approach to ESD

Webster (2007) argues for a new approach to ESD based on an ecological worldview tied to whole system thinking and complex systems science. He explains that this worldview underpins developments in such fields as biomimicry (design influenced by nature), 'cradle to cradle' industrial systems (McDonough & Braungart, 2002, Ness & Field, 2004), industrial ecology, housing and city design, and full-cost pricing. It contrasts with an older mechanical worldview that modelled the economy as a linear 'take-make-and-dump' process with 'only a crude and partial feedback device 'the market', and a one-sided materialistic view of human decision making (the rational consumer)' (Webster, 2007, p. 40).

In Webster's opinion an ecological worldview is the key to sustainability for it can prompt the design of appropriate technologies and lead to a new industrial revolution pioneered by businesses that adopt such innovations as closed-loop or 'cradle to cradle' production. It is also the key to an educational revolution that 'offers new and coherent stories of what makes

a sustainable world' (p. 39). Webster suggests that most ESD is essentially about ecological modernisation, environmental management, or the greening of current forms of production and consumption. In his view it fosters guilt, focuses primarily on what individuals (rather than corporations, governments and social movements) should do, and fails to engage learners in critical thinking. In his terminology it is 'schooling for a slightly less unsustainable future' (p. 40) and a genuine ESD should explore how insights from ecology can transform economy and society and thereby 'inspire and illuminate a future worth having' (p. 40).

While others have sought to introduce an ecological worldview and systems thinking into education and curriculum planning (Selby & Pike, 1987, Sterling, 2004), Webster suggests that 'a thorough understanding of this approach can be a barrier as much as a key to a better ESD which has limited resources at its disposal' and that 'it may be easier at this stage to use case studies of designers and businesses that have distilled and used the core ideas to create insight, promote imagination and mould better stories about the future' (p. 40). He draws an analogy with the Enlightenment and suggests that what teachers and students need are models that anchor the ecological worldview in their minds in a similar way to that in which Newton's 'clockwork models' anchored the mechanical worldview.

Sense and Sustainability and the Ellen MacArthur Foundation

Having already sought to introduce a re-shaped ESD via a publication for the Field Studies Council (Webster, 2004) and the article cited above, Webster led the writing of *Sense and Sustainability (S&S)*. Like the book published by the Field Studies Council this is a teacher-friendly text, generously illustrated with cartoons, photographs and diagrams, and supported by case studies, activities and classroom-ready resources. Its key message is that we need to design industrial and educational systems so that they emulate nature with closed feedback loops. Waste from one process needs to become 'food' for another and education needs to be modelled on nested loops of enquiry that examine how nature works, how participative learning works, and how a progressive circular economy is evolving (*S&S*, p. 127). ESD would then become a hopeful enterprise, based on the prospect of a world of abundance, that involves seeing existing problems differently and testing realistic solutions.

The Ellen MacArthur Foundation (EMF) 'works with education and business to inspire people to re-think, re-design and build a positive future' (EMF website). It is sponsored by BT, B&Q, Cisco Systems, Renault, and the National Grid, and employs Ken Webster as head of learning. It engages teachers via outreach, CPD and the creation of stimulus resources for use in the classroom, lecture theatre and online, focuses on the 14 – 19 curriculum and higher education, and has several major projects relating to STEM (science, technology, engineering and mathematics), design and technology, economics, and enterprise and business education. While the Foundation's web pages make no reference to ESD, the term occurs over fifty times in *S&S*. The authors seek to 'bring into the ESD arena a simplified and coherent perspective . . . which stands a good chance of being intuitive to understand and apply' (p. 14) and hope that the book's key ideas 'will enrich and simplify how teachers approach their ESD work' (p. 18).

With the fall of the New Labour Government in 2011 and the ending of its support for ESD, EMF is now probably the best funded organisation working in this field in England. The manner in which it introduces and reproduces ideas relating to sustainability/unsustainability,

through such publications as *S&S*. are therefore of interest to all those who wish to see a more realistic and critical ESD take root in schools and colleges.

Viewing these initiatives in a wider context

Before examining *S&S* in some detail, it is useful to remind ourselves that the text was written at a time of crisis for global capitalism caused partly by technological change. New technologies mean that decreasing amounts of capital and labour are needed to produce each unit of economic output. Productive investment cannot absorb all the profit or surplus value that capitalists produce, so over the past thirty years, during an era of neoliberal capitalism, they have increasingly turned, with the aid of the state, to financial speculation. This proved more profitable than productive investment for a time, but led to huge borrowings by banks and consumers to maintain asset, property and credit bubbles that eventually burst. Debts were then transferred from banks to governments which, as in the case of UK coalition, then embarked on radical austerity programmes to reduce their level of borrowing.

Mainstream economic debate in the UK and elsewhere currently focuses on the severity and speed of cuts and whether or not they are delaying economic recovery. While the neoliberal right hopes that a revived manufacturing sector will lead the recovery and provide new jobs to replace those lost in the public sector, the social democratic left urges yet more borrowing and spending to assist recovery. Amongst these Keynesians are those who advocate a ‘green new deal’ (NEF, 2008) and they find support in international circles from both UNEP (2009) and the Socialist International (SICSW, 2010). To tackle the ‘triple crunch’ of the banking crisis, climate change, and rising energy prices, the authors of the UK proposal suggest first a structural transformation of the regulation of national and international financial systems and major changes to taxation, and second a sustained programme to invest in and deploy energy conservation and renewable energy, coupled with effective demand management. Other prescriptions for the greening of capitalism come from Hawkins, Lovins & Lovins (1999), Porritt (2005), Korten (2010), and George (2010). They need to be viewed against the background politics of recession with national protectionists, regulatory liberals, cosmopolitan liberals, and anti-capitalists all offering different diagnoses and prescriptions (Gamble, 2009).

That those proposing social alternatives have failed to win the argument is largely due to the complex cultural transformation that has taken place since 1990 in the way late modern societies frame and manage their environmental problems. The new social movements that sprung up in the 1960s and 1970s sought to tie modernity to revised understandings of democracy, efficiency, futurity, and identity, in ways that emphasised ecological virtues such as sustainability. In the subsequent post-ecologic turn (Blühdorn, 2007, Læssøe, 2010) these understandings and virtues have become symbols of inefficiency and resistance to innovation. Neo-materialism, technological optimism, and the rise of symbolic politics, mean that the majority now identify with consumer capitalism, are content to delegate environmental management to technocrats, and accept media messages that foster self-deception and avoidance of issues. Ecological problems have been reformulated as scientific, technological, economic or managerial issues; ecological modernisation and environmental economics are seen as key to continued economic growth; and narratives of technological efficiency and corporate responsibility now overwhelm those shaped by ecological idealism and the need for new forms of radical democracy.

Technological utopianism

Given the level of debate surrounding the current crisis and possible routes to economic recovery, it is surprising that S&S overlooks the role of neoliberalism and financial speculation in diverting investment from productive investment in ‘cradle to cradle’ technologies, the opportunity to identify the changes it promotes with advocacy of a green new deal; and the extent to which its arguments reflect the post-ecologic turn. There is much attention to waste-free technology and changed ways of thinking about production and consumption, but in keeping with the cultural turn, too little attention to how political economy might be restructured to enable the transition to sustainability that the authors’ seek. In agreeing with Porritt that ‘capitalism is the only game in town at the moment and sustainability won’t be achieved without business’ (S&S, p. 143, Porritt, 2005), and appearing to suggest that business and markets will inevitably adopt the technologies it outlines, S&S risks technological utopianism.

Technologies, such as those advocated in S&S, do not flow directly from ecological principles. Ideas such as closed-loop production, biomimicry, full-cost production, and indeed sustainability itself, are interpreted and applied in ways that are shaped by political economy and class conflict. In capitalist society, technological designs embody strategies for exploiting human and non-human nature, commoditising resources, and extending market relations (Levidow, 2003). Ecological designs are primarily about increasing resource productivity, reducing costs, and ensuring the continuation of favourable conditions of production (clean air and water, waste sinks, fertile soil, uncongested urban and rural space, healthy workers). There is nothing inevitable about the nature or rise of such designs for those with wealth and power largely determine what gets used, made, wasted, recycled and taught. S&S lies firmly in the tradition of technological utopianism (Segal, 1985, Schatzberg, 2002), presenting an industrial and educational utopia to be achieved through the inevitable rise of systems thinking, closed-loop production, and distinctive forms of pedagogy. This utopianism means that it gives too little attention to the need for capital to grow if it is to survive, the powers behind markets and the state, and radical social alternatives that might enable the changes its authors wish to see. These alternatives include eco-socialism.

Eco-socialism

Those who advocate the greening of capitalism via a green new deal fail to realise that ‘money does not grow on trees’ and public debt cannot be pushed ever higher without regard to capacity to repay. They also need to recognise that technological change now means that economic recovery cannot restore full employment unless there are reductions in working hours. As the production problem has now largely been solved in the UK (we have the technical capacity to produce beyond our capacity or need to consume), it is time to shift the aim of economic policy from maximising economic growth (growth of output) to providing people with what they need and want to the maximum extent possible within the resources available (Jackson, 2009, Shutt, 2010, Thompson, 2008). Growth is necessary to sustain capitalism by providing constant new opportunities for investment, but it leads to inequality that is exaggerated by technological change and structural unemployment. It also depletes natural resources and degrades those conditions of production (clean air and water, fertile soil, uncongested space, healthy workers) on which it depends.

Eco-socialists have long believed that technology provides the key to liberating people from the ‘treadmill’ of work and consumption, and giving them time to develop themselves and their community to the fullest extent possible (Gorz, 1994, Little, 1998). The key to

sustainability is the social control of capital to direct it into socially useful production and social control of technology to ensure it is used in a socially responsible manner (Croall & Rankin, 2000). Social control should involve participatory planning or collective decision-making at local, national and international levels (Albert, 2006), and new forms of democratic accountability and deliberative democracy (Baber & Bartlett, 2005). A basic or citizens income, paid at a flat rate to all irrespective of their employment status or income, would incentivise people to undertake necessary work, including caring for others and restoring the environment. There would be more use of waste-free technologies, more goods and services would be built to last, more would be provided communally, public services such as transport would be improved, communities and nations would be more self-sufficient yet more internationalist in outlook. Writers on eco-socialism include Pepper (1993), Lowy (2005) and Kovel (2007).

Such innovations as sharing, borrowing, co-ownership, product libraries, co-operatives, local economic trading schemes, and open-source software can be seen to be heralding the transition to eco-socialism (North, 2006, Wall, 2007) as can designs for ecological and global citizenship (Dobson, 2003, Monbiot, 2003). It has to be admitted however that eco-socialism has lost support with the post-ecologic turn and remains a somewhat utopian project with continuing debate over what forms the social control of capital and technology might take and how collective decision-making and deliberate democracy might work. There is no clear vision of the transition to eco-socialism although proposers look favourably on current anti-capitalist protests (Gilbert, 2008) and developments in Latin America (Foster, 2009). The shape of eco-socialist societies will emerge via co-revolutionary politics (Harvey, 2010) as people struggle to establish them and learn through reflection and action on their experience (praxis or critical action research). As regards ESD, Dryzek (1997) shows how something approaching eco-socialism emerges from a critical analysis of environmental discourses, and in *What We Consume*, the curriculum I devised for WWF in the late 1980s, I showed how eco-socialism could be presented to older school pupils in ways consistent with the procedural values underpinning the *Programme for Political Education* (Crick & Porter, 1978). See for example Activity 1.10 Introducing Environmental Politics (Huckle, 1988b) and Activity 10.7 Encouraging Socially Useful Production (Huckle, 1990).

Even more sense and sustainability

Craig Johnson worked with me on *What We Consume* and it is therefore a little surprising that S&S lacks political realism. This is seen in Chapter 2 which offers five ways to reconcile economy with ecology (circular economy, population crash, change of heart, return to traditional way of life, and grow first and clean up later) There is no mention of a green new deal or eco-socialism, or indeed any other model of political economy that might promote ecological designs and sustainability. Students are denied opportunities for the critical thinking (frequently advocated in the text – see pages 31, 86, 119, 121 & 143) and a genuinely transformative education (Rathzel & Uzzell, 2009). At a time when there are almost one million unemployed young people aged 16 to 24 in the UK, and increasing numbers of 14 – 19 year olds recognise that capitalism fails to offer them a future, this is a major omission (Kingsley, 2010).

So what should Webster and Johnson and their colleagues at the Ellen MacArthur Foundation do? Much of their argument is valid provided it is placed in a more realistic context by introducing even more sense into the debate. They should explore how capitalism adopts the technologies they outline on its own terms. They should be more realistic about the role of

the state, planning and social movements in encouraging such technology. At the same time they should explore with students and teachers the drivers of consumerism, the limits of localisation, the virtues of critical realism as a form of systems thinking, and the potential of eco-pedagogy to realise the educational reforms they advocate. The rest of this essay will examine these topics.

Capitalism adopts waste-free technology on its own terms

Capitalists will adopt waste-free technology if it offers ways of producing and selling commodities at a greater profit and/or they are required or encouraged to do so. Their decisions are clearly shaped by regulations, taxes and subsidies that result from compromises between branches of capital, the labour and environmental movements, and the state. Waste-free technology may improve resource productivity, offer ways of avoiding taxes on waste disposal and/or resource depletion, and provide a way of passing environmental costs to consumers under the cover of sustainability. They increasingly transport and dispose of the commodities they buy and are offered new 'green' products and services that are promoted as having a lower ecological footprint than those they replace.

Maycroft (2000) reminds us that under capitalism a 'green' commodity is, like sustainable development, an oxymoron. Green implies self limitation or ecological limits yet capitalism must continue to develop new lines and promote these by such techniques as product differentiation, stylistic and technical obsolescence, niche marketing, and the expansion of credit. Green styling and marketing can be used to obscure the real social and environmental costs associated with a product ('green washing', S&S, p. 85) and to compensate for the lack of meaning (alienation) attaching to a commodity that results from the separation of its production and consumption.

Maycroft goes on to explore three green product strategies that feature in *S&S*: the product service, design for disassembly, and the revalorising of rubbish. It is claimed that product services reduce the need for consumer goods as consumers rent or lease a service rather than buy a commodity. *S&S* (p. 82) gives the example of leasing or renting, rather than buying, a washing machine and suggests that manufacturers who become deliverers of services, rather than sellers of products, will take machines back for continuous repair, reuse and remanufacturing. Such a claim contradicts the current realities of car, mobile phone or washing machine rental/leasing whereby customers are continually pressured to upgrade to new models and old stock is dumped or sold off at discount. Product services are used mainly by the poor who cannot afford to buy outright or by the rich who seek trouble-free access to the latest models. In that they prevent self-repair they undermine consumers' autonomy and bind them more tightly to capitalist logic.

Design for disassembly is a method of manufacture whereby components are designed and assembled for quick disassembly and easy recycling. *S&S* gives the example of a new type of chair (p. 26) designed to be non-toxic, easily repaired, easily disassembled, rentable, and returnable. Elsewhere there is a case study of InterfaceFLOR, a flooring manufacturer that has adopted design for disassembly (pp. 77 – 78), and chapter 4 suggests that such technologies are also being explored by such corporations as Du Pont, General Electric, Nike and Toyota. Maycroft argues that current economic realities mean the recycling of materials and components is often uneconomic, that the ecological benefits are easily undermined by the environmental costs of maintaining multiple and/or distant recycling facilities, and that the work involved is often dirty and alienating. The environmental benefits of recycling a

car's components are minimal compared with the environmental damage done by that car in its lifetime, and the use of recycled materials/components may be primarily a form of green washing and/or a way of increasing profit rather than reducing prices.

Revalorising rubbish is a way of taking something that would be discarded, rather than reused, repaired or recycled, and adding new value to it. An example is provided by the fish farm in Wakefield (S&S, p. 90) that uses waste cardboard to feed worms that in turn feed fish, and wood-chip from willow, fed by waste sewage, to fuel the boilers that warm the water in which the fish live. This farm provides transitional employment and training opportunities for 'less academic and disengaged youngsters' and supplements the diet of ethnic minority communities with culturally appropriate food. Such features owe something to its position partly outside capitalist social relations and remind us that waste-free technology can only realise its true potential in economic systems geared to production for use rather than exchange.

In summary, Maycroft suggests that green product strategies are currently suited to short-run, expensive, life-style products (domestic luxuries) and long-run, mass produced goods subject only to incremental change, but not to most products now manufactured. They do nothing to lessen our dependence on the market and reinforce the idea that it is by spending money as green consumers that we realise sustainability. They form part of the agenda of technocratic managers, designers, and politicians but have little to say to the poor who may bear the bulk of the social costs in terms of higher prices, more regulated consumption and disposal of goods, and more alienating work.

The role of the state, planning and organised labour and social movements in encouraging waste-free technology

Anderson (2007) reminds us that in a market economy the prices of materials and waste sinks may be too low to act as an incentive to close loops in the production process. Mainstream environmental economists have addressed this problem by developing mechanisms to ensure that recycling takes place where it is socially desirable and efficient. They regard the waste, pollution and environmental degradation associated with the linear economy as products of market failure and advocate taxes and charges to internalise such externalities and encourage a circular economy. In the case of recycling, these would take account of the market value of the recycled materials, the reduced cost of waste disposal (incineration or landfill), and the reduced cost of extracting virgin materials. Beder (2006) offers a powerful critique of such market environmentalism which serves to further commoditise the environment and remove decisions from public scrutiny.

It is the state that largely decides whether taxes and charges will be levied, laws introduced, subsidies provided, and land use and the economy planned in ways that close loops in the production process. ESD therefore requires a strong component of political education if students are to fully understand such issues as the role of a one-party state and central planning in encouraging the introduction of waste-free technology in China (S&S, p. 29), the introduction of cradle to cradle production in the Netherlands (p. 79), or how carbon can be priced in ways that reduce inequality (p. 143). Critical thinking might explore the following questions. What are the power relations that govern land use and development in Masdar and Dockside Green (p. 75)? How is innovation at DuPont, General Electric and Nike presented to the media and shareholders (p. 83)? What say do residents and workers have in the formulation and realisation of these ecological designs?

S&S gives too little attention to such questions but does draw attention to how the existing capitalist system works: that it ‘absolutely depends upon endless growth in consumption and demand and in thus inherently unsustainable’ (p. 35), and that the ‘money system’ accumulates ecological debt as it attempts to repay economic debt (p. 64). It argues that ESD is a ‘context thing’ (p. 40), that the Jevons paradox (gains in resource productivity, while in the short-run producing resource savings, may in the long-run result in higher resource use, pp. 40 -42) and the Prisoners’ Dilemma (lack of knowledge of others’ intentions/actions often means that we fail to act in the common interest, pp. 42 – 43) are systemic problems, and that individuals are only likely to act to realise their common interest in sustainability if there are appropriate incentives. Subsequent discussion seeks to persuade the reader that sustainability is a systemic/institutional rather than moral/individual problem (p. 43) but there is too little attention to ‘what can be done with a system that promises so much and delivers so little’ (p. 45) so that ‘prices tell the ecological and social truth’ (p. 47) and citizens once again demand change from politicians and institutions rather than being content to shop for hazard reduction (p. 46).

Technological utopianism means that S&S neglects struggles over technology. The reader is left hoping that enlightened designers, capitalists and teachers will introduce appropriate designs, production methods and ideas and that having taken root these will grow. Despite a brief recognition that ‘it is a citizenship question first’, and a quote from Al Gore on the importance of changing laws and solving the democracy crisis, (p. 142) S&S remains somewhat idealistic. Where are the workers and citizens’ movements campaigning for ecological designs and appropriate technology that deliver the social, cultural and personal dimensions of sustainability alongside the ecological and economic? Why is it largely assumed that the interests of InterFLOR, Toyota, Nike, Tata, and others featured in the text, coincide with those of the students who will study this material? Should the authors not be more critical of the kind of analysis offered by Al Gore (Luke, 2008)?

The drivers of consumerism and the limits of localisation

S&S suggests that ‘there is no requirement for less consumption per se or a spontaneous change of heart’ because ‘the concept of waste is removed’ if ‘the economy is based on cyclic harvesting of natural resources using the Nature as Capital approach’ (p. 47). Abundance by design means we can ‘let go the guilt’ (p. 17) associated with consumerism, although ‘the pattern of consumption will change profoundly’ due to the end of cheap energy and the introduction of full-cost accounting (p. 47).

Elsewhere it is acknowledged that consumerism ‘is an exciting context for discussion in schools and colleges and that understanding consumerism and its limits is surely at the heart of what we think terms like ‘well being’ and the ‘quality of life’ mean, and thus what education for sustainable development might entail’ (p. 45). Mention is made of the social costs of consumerism, the manner in which green consumerism has displaced eco-activism (a feature of the post-ecologic turn), and that an increasing number of ‘new realists’ reject materialistic values and individualism in favour of community, locality and self-sufficiency, while continuing to enjoy some consumer products.

Such treatment of consumerism is to be welcomed although there should be a more open and thorough treatment of the treadmill of capitalist production and consumption (Huckle, 1988a, Morgan, 2011) and the associated limits to growth (WWF, 2010). Students should understand

capitalism's need to continually invent and promote new wants, the strategies by which it does this, the linked economic and ecological crises that result, and the attractions of a society based on production for need and the fulfilment of everyone's potential. They might explore the work of culture-jammers such as Adbusters, watch films such as *The Story of Stuff* and *The Yes Men Fix the World*, evaluate less materialistic societies underpinned by more democratic social relations, and consider ecotopias (Pepper, 2007). The sketch on page 130 of S&S represents the authors' vision of a more desirable society and students might discuss what ethical, political and planning principles are most likely to result in such a landscape.

S&S gives too little attention to globalisation that renders closed-loop production and the application of waste-free technologies more difficult by stretching supply and distribution networks. There is discussion of localism and the transition town movement as means of reconnecting ecology and economy, people and planet, and community and individual (p. 71) but the writers might draw on a wider range of social innovations in economy and livelihood that reject the social logic of capitalism, such as those that can be seen to herald eco-socialism (see page 4 above), and give some attention to the limits of eco-localism (Albo, 2007). North (2006) labels such innovations 'intentional localisation' and links them to a less globalised capitalism and a new regime of accumulation with waste-free technology able to supply solutions to climate and resource problems. He contrasts this with 'immanent localisation' whereby businesses simply move economic activities that have high transport costs closer to their markets. Such localisation ignores what is produced, may use unsustainable technologies, does not entail excessive regulation, and is likely to lead to a more regionalised global economy. S&S should pay more attention to local/global interdependence and the ways in which the connections between places can be managed to maximize sustainability along with human freedom and democracy.

Systems thinking, eco-pedagogy and critical realism

Central to S&S's educational rationale is the participatory learning cycle (action research) whereby innovative learning approaches are used to develop insights into how nature works and how innovative 'cradle to cradle' industry works (p. 101). Chapter 5 uses case studies of a primary school garden, an eco-house, Japan's bullet train, and farm design to suggest what might be involved in such learning. It is labelled transformative and linked to an holistic or systems worldview and an organic theory of social change (p. 100).

This essay has suggested that a systems worldview provides an inadequate philosophical foundation for a critical ESD. Yes 'all life on the planet is interconnected and interdependent' and 'meaning is derived from understanding relationships' (p. 100), but ESD should go further than S&S and provide accounts of the interconnections, interdependences, and relationships within and between the bio-physical and social worlds. Advocates of ESD based on systems thinking are too ready to draw lessons from an imagined nature outside society, to overlook the complex social structures and process that shape the construction of nature, and to attribute the crisis of sustainability to inappropriate ways of thinking. Kahn's typology of forms of literacy linked to ecopedagogy (Kahn, 2010) suggests that S&S is strong on functional/technical literacy (the 'cradle to cradle' thinking and design skills needed by the green economy) and adequate on cultural literacy (the cultural practices that may help or hinder the related forms of production and consumption). Preceding arguments have however suggested that it is weak on critical literacy or the consideration of those political structures

that might allow ‘cradle to cradle’ technologies to fulfil their potential in ways consistent with Earth Charter principles (Corcoran et al, 2005).

Where can a critical ESD find a more realistic philosophical foundation than that provided by systems thinking? Political ecology (Robbins et al, 2010) that relates environmental issues and change to economic, political and cultural factors is one source of ideas while another framework is provided by Biel (2006) who combines systems theory with political economy. Yet another is critical realism, a philosophy that that can hold together the multi-layered and linked structures, processes and events in the bio-physical and social worlds, and at the same time draw on systems and political ecology perspectives (Dickens, 1996, Huckle, 2004). Such philosophies suggest and require an ESD that promotes critical literacy and change without telling learners what to think and do. Readers seeking advice on ‘stimulating without prescribing’ and helping learners to gain ‘plural perspectives’ (p. 127), including that of eco-socialism, whilst also ensuring that critical ideas receive consideration, might consult the Open Spaces for Dialogue and Enquiry Methodology website (OSDEM, 2011) where they will find advice on teaching for critical literacy.

Realising the Eco-restorative School

Chapter 6 of S&S maps the four stages through which schools and colleges might move as they seek to become eco-restorative: underpinned by systems thinking, producing more energy than they use on campus, and enhancing biodiversity and social capital. Such a transition would enhance the meaning and purpose of schooling with a curriculum focussed on learning for social change. Schools would be smaller, more localised, with strong links to the local and wider community and much use of personalised and internet based learning. This scenario is linked to the previous Labour Government’s framework for sustainable schools with key questions offered to challenge teachers as they address such topics as energy, transport, and social inclusion (p. 131/2).

Such a radical prescription is to be welcomed but S&S should pay more attention to the restructuring of schooling along with the wider economy. The need to revive economic growth is bringing an increased emphasis on vocationally relevant knowledge, more provision of schooling and related services by private corporations, a related loss of democratic control over schooling, and increased social control and stratification of the young by means of conservative curriculum reform and continual testing and certification (Benn, 2010). The needs of capital and the state continue to override those of students and society, and what ESD is provided will continue to be ‘schooling for a slightly less unsustainable future’. After the crash of 2008 the world has returned to the pre-crisis mindset (Elliott, 2011) and the UK Government’s environmental record is the subject of strong criticism (Harvey & Carrington, 2011).

The continuing debate

As enlightened businesses adopt, or consider adopting, waste-free technologies we can expect them to sponsor agencies such as the Ellen MacArthur Foundation as part of their corporate social responsibility (CSR) programmes. They have realised the need to align their CSR activities with ESD (Manteaw, 2008) but in the case of the Foundation’s work with schools, this is being done in ways that emphasise technical literacy, neglect critical literacy, and so provide only part of a comprehensive ecopedagogy.

Webster and Johnson may argue that they are practising the art of the possible and that to explore the issues raised in this review would strain their relationship with the Foundation and its sponsors. Before making that argument they might remember Peter Martin's work at WWF and his political skill in maintaining support and funding for what were often radical publications. Yes, funding for ESD is now more difficult to find. Yes, schools are less receptive to challenging curriculum innovation. But like Peter, we should cling to a vision of what may be necessary rather than what is possible. Faced with a deepening economic and ecological crisis and technologies that offer us the prospect of sustainability, we should not shrink from exploring the politics that will render that prospect a reality. I will be interested in Ken and Craig's response.

Notes on contributor

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