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#### How to cite:

Dewberry, Emma (2018). Eco-literacy in Transition: the role of design ecologies in developing our capacity for radical change. In: Can Design Catalyse the Great Transition? Papers from the Transition Design Symposium 2016 (Kossoff, Gideon and Potts, Ruth eds.), The School of Design at Carnegie Mellon University, Schumacher College and the New Weather Institute. pp. 127–136.

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Version: Version of Record

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# Eco-literacy in Transition: the role of design ecologies in developing our capacity for radical change

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## Introduction

This short paper explores the people-product relationships that are forged in the course of everyday life and addresses the role of design ecologies in fostering long term socio-ecological adaptability and resilience. I reflect on the premises and principles of Transition Design and explore the different kinds of knowledge required for designing with the natural world in mind.

It is unnecessary to repeat the well-trodden ground of the limits of ‘modern’ societies responses to the environmentally damaging behaviours that are endemic to industrialisation. I will, however, summarise these ideas through describing two very different perspectives on sustainability — ‘technical sustainability’ and ‘ecological sustainability’ — as described by Environmental educator David Orr (1982) and industrial ecologist John Ehrenfeld (2008).

The first approach, described by Orr and Ehrenfeld, is ‘reducing unsustainability’ or ‘technical sustainability’ and stems from the modern, deterministic and reductionist mindset. It proposes that solutions to unsustainability will emerge through the integration of new science and technology and the application of new regulations and responses to market drivers. It is argued that in making what we currently do less environmentally damaging we can simultaneously support current models of growth and development and shift society towards sustainability.

By contrast, the second approach, also outlined by Orr and Ehrenfeld, is ‘creating sustainability’ or ‘ecological sustainability’. This encourages a reimagining of human requirements through creating new solutions to the provision of food, shelter, energy

and materials alongside the management of the resources that derive from these processes (currently termed waste).

Both perspectives reflect an old dilemma that results in a plurality of views on ecological and social disruptions. The case for continuing 'as is' with a reliance on technological fixes continues, almost universally, to dominate thinking in strategic, political and cultural domains. The contemporary crisis caused by global industrialisation and a growing global population remains distant from, and unaddressed, in the main political decision-making arenas.

The Transition Town movement, however, embodies an alternative approach to sustainability, acknowledging head-on the human-ecology-resource crises (i.e. Peak Oil) and exploring new solutions through alternative modes of producing (distributed modes) and of consuming (local modes). Solutions are particularly rooted in context and specifically connected to place.

The Transition Design Framework likewise resonates with the more radical scope and activities associated with an ecological paradigm. It proposes theories of change informed, for example, by social practice theory and multi-scale perspectives of technology, innovation and change; visions for transition that reframe lifestyles and the expectations, resources, communities and systems that support these; the need for a focus on posture and mind-set in terms of alternative ways to think, to learn, and to do; and that this framing of transition will inform of new ways to design. It is hoped that these approaches will co-evolve, adapt and develop in context-specific ways.

These ingredients represent a call to 'a change' in current design practices and should become common to all design practice in its journey away from the industrial paradigm. The danger of mapping 'Transition Design' apart from 'normal design', however, is that it proclaims 'difference' and potentially limits opportunities for achieving change of the magnitude required. As we have witnessed over the last 30 years or so, 'eco' or 'sustainable' design has provided a frame for an environmental and social focus in design but, in-so-doing, has inadvertently permitted other design activity to carry on as normal. This has resulted in frustratingly small steps forward during a period when the external signals for the need to adopt alternative strategies have been at once obvious and blatantly ignored. The label 'transition' may well be a useful device to articulate a different approach but we must be careful for it not to become another reason for such thinking and action to be marginalised and ignored. As a global society we are in

transition and thus we need new approaches and tools to stimulate hope and inspire peoples' imaginations for an equitable, everyday life.

This paper aims to explore some of these ingredients for Transition Design specifically relating to the ideas of ecological mind-set and the importance of creating sustainability (alongside reducing unsustainability) to embrace a deeper understanding of design ecologies and their landscapes of innovation.

## **Towards an ecological mind-set**

Illich (1971:1) prophetically comments in his book *Deschooling Society* “that the institutionalization of values leads inevitably to physical pollution, social polarisation and psychological impotence: three dimensions in a process of global degradation and modernised misery.” I am both struck and saddened by the relevance of this comment 45 years on. The issues identified in Illich’s critique of industrialised and institutionalized society are exemplified in the education crisis of our own era. The continuing development of educational processes that are designed serve the demands of industrialization diminishes opportunities to convey other types of knowledge, in particular those that connect people to place. Contemporary responses to unsustainability reflect institutionalized and risk adverse approaches to change that fail to connect citizens with the consequences of their collective actions.

Societal ‘norms’ need to be informed by eco-literacy. An example of this is industrialised societies’ mind-set on ‘waste’: discarded materials and products are seen as ‘waste, rubbish, garbage’ – a collective language that continues to support the ‘normality’ of linear resource flow. This is in contrast to an ecological mind-set that views all resources as useable resources to be effectively re-crafted for other uses.

Changing mindsets is a challenge when formal-based knowledge institutions are required to accommodate governance that is centralised, generic and non-specific. Most formal learning today delivers the opposite of the knowledge and skills required to foster more ecologically aware mindsets and thus the capacity for effective transition. It is also difficult to propose change in established modes of learning from the very mindset that caused the problem in the first place. As economist, John Maynard Keynes (1935) wrote “The difficulty lies, not in the new ideas, but in escaping from the old ones ...”.

The question is, how can we develop eco-literate interventions that promote new ways of understanding our world and our place in it – where the questions of relationship between personal endeavour, societal need and ecological boundaries can be better articulated and valued. This requires both a spirit of exploration and conditions that are conducive to adventure and risk-taking, neither of which are much in evidence in most contemporary educational systems. Both formal and informal learning need to reanimate responses to unsustainability through new types of ecologically framed literacy.

Eco-literacy represents a shift in the industrialized mindset that asks people to understand the fundamental role of natural systems in human society, and the relationship between their own well-being and the health of those natural systems. It is not only the theoretical underpinning of the interconnectedness of systems that is important but also the value of action-oriented eco-literacy. David Orr emphasises this point, “The study of environmental problems is an exercise in despair unless it is regarded as only a preface to the study, design and implementation of solutions. The concept of sustainability implies a radical change in institutions and patterns that we have come to accept as normal. It begins with ecology as the basis for the redesign of technology, cities, farms and education institutions, and a change in metaphors from mechanical to organic, industrial to biological.” (1992:94). Eco-pragmatism as an approach to learning nicely aligns with design-based education. The teaching of design thinking, process and practice offers up useful spaces to explore the relationship between ecological theory and practice to foster new ways of designing.

The transition design framework provides a structure to deliver formal, theory and practice-led eco-literacy in the education of expert designers as described by Manzini (2015). Teaching eco-literacy to expert designers has the potential to permeate other, often informal types of designing (co-creation, activism, hacktivism, repair and maintenance) as more ‘expert’ designers engage with a wider landscape of design, of which non-expert designers (citizens) are a part.

The last section of this paper explores an integrated, ecological view of design. It also explores the role of design outcomes (in this case a product) to convey the ecological-social-technical story of the product as part of the journey of consumption, use, reuse and the redistribution of resources at the end-of-life.

## Innovation landscapes and design ecologies: finding ways to tell new stories

Design thinker, John Thackara (2005) describes a contemporary dislocation in thinking. He says that there is a common consciousness that the world is ‘out of control’ – that it is all too complex for us to delve into, to interrupt and understand. But we also, he says, have culture, a language and the ability to understand abstract phenomena; to share knowledge and ideas and to shape solutions through design. So, on the one hand, there is much that seems big and distant, and on the other there are, all around us, things that are accessible and at the right scale – and here we have the opportunities and scope to act differently. “The dance of the big and small entails a new kind of design. It involves a new relationship between subject and object and a commitment to think about the consequences of design actions before we take them, in a state of mind – design mindfulness – that values place, time, and cultural difference.” (2005: 226).

We can connect to this ‘bigness’ through design thinking and practice where the designed outcomes provide a useful response at a meaningful scale.

If Transition Design represents a shift from reductionist to holistic values, how can these best be represented in the outcomes of a newly framed design process? And how can these outcomes not only help to grow expert designers but also to engage citizens, more actively than passively, in new types of relationship with the resources they consume? Seeing the value of creating different types of ‘made’ future in a context of ecological parameters is, I believe, a primary role of design education. These values are also embodied through the designs created for, and in, society.

In my twenty years or so of exploring design for sustainability, I don’t believe the relationship between bigness and smallness has been properly addressed. The ‘beyond ecodesign’ approach to reconceiving human-material relationships is difficult to implement because ‘beyond ecodesign’ shifts thinking, and therefore action, beyond an efficiency imperative. This deeply challenges the core premise of the industrial model: that is, to get more stuff, to more people, at a faster rate. We may make products more efficient but if we consume so many more of them than before, overall gains in efficiency are lost. Efficiency often only tweaks at the edges of the change needed and may not address the interrelated ‘bigness’ issues that we face.

By contrast, concepts such as ‘sufficiency’ present a challenge to an economic model that favours consumption of large quantities of resources. Issues such as resource scarcity, flows and sinks, the scale of consumption, manufacturing futures, and economic models are highlighted through explorations of sufficiency. Exposure to such debates are vital for developing ecoliterate designers, so that they can comprehend the rationale of ‘beyond single-issue’ foci such as recycling, disassembly and energy efficiency. It is not that these foci are irrelevant, but rather that they need to be understood in an interrelated way.

## Developing eco-literacy in design education’

The Open University teaches design modules to over 1,000 students a year. In 2014 a new third level program was launched exploring sustainable design and innovation. In this module a framework was created to help students consider the interrelated landscape of a designed outcome. The innovation landscape (Figure 1) is a matrix that links multiple scales of design (product, service, system) to the material, people and context of the design to make visible the multifarious nature of design ecologies.

**Figure 1 Innovation landscape (Dewberry 2014)**

<b>Multiple scales of design</b>	<b>SYSTEM</b> Need Function Resources Impacts Adaptability			
	<b>SERVICE</b> Need Function Resources Impacts Adaptability			
	<b>PRODUCT</b> Need Function Resources Impacts Adaptability			
	<b>DESIGN AND INNOVATION LANDSCAPE</b>	<b>MATERIAL</b> Elements Technologies Interfaces	<b>PEOPLE</b> Requirements Actors Interactions	<b>CONTEXT</b> Governance Living Systems Infrastructure
<b>DESIGN ECOLOGY</b>				

Each square of the matrix has a number of questions associated with it to prompt the designer to consider a range of issues. For example, the product-material square scopes out issues of resource use across lifespan, the nature and ecosystem impacts of resources (renewable, toxic, scarce), the nature of, and reliance on, technology (fast/slow, durable, adaptable), product infrastructure (robust, flexible, adaptable, vulnerable to change), types of interfaces (versatile, accessible, maintainable), the needs the product meets and its core functionality and resilience.

This is a useful exercise for looking at any everyday product in 'its landscape' of innovation opportunity. It is often easier to complete the product level than it is to consider responses at the service and system levels. As we move to the upper right-hand side of the matrix the issues are further removed from the ones usually associated with design decision-making and linked to broader concerns such as geographical locations of ecological impacts, ethics of resource use, systems of regulation, cultural norms and sensitivities or technological trends. Take the washing machine as an example. In the bottom left corner we might be concerned with issues of resource use across lifespan – using less metal, light-weighting, maintenance, using less energy, reducing detergent use, reducing water, cold water washes only etc. At the system level the focus shifts to question the need for clean clothes, cultural expectations of clean, access to hygiene, domestic grey water use, the infrastructure of redistributed manufacturing, the cyclical flow of resources and the diversity of regulation. These jumping off points for innovation are not the ones usually considered in the washing machine's design. They instead open up the debate concerning the role of clean clothes in society and how this need can best be met.

This kind of design has the potential to (quietly) educate us, to develop new narratives about everyday life. Products that result from large-scale and global production processes tell a common story, regarding speed of consumption, passive use, linear flows of resources, technology lock-in, technology redundancy and wastefulness. Designs that help to create sustainability will tell different types of story: mindful of resource origins, impacts and use; regenerative; celebrate locality and cultural difference; promote active people-product interactions across lifespan (e.g. repair, adaptation); and foster new knowledge and skills.

The Fairphone (Figure 2) is one of the most interesting examples of how a different story can emerge in a complex, globalised and fast-tech market. As a relative newcomer to the smart-phone market, Fairphone pitches in with a set of values and characteristics that is different to its competitors. The phone has the usual technical specifications but



also opens itself up (both metaphorically and physically) to reveal its ethical make-up – which, among other things, responds to concerns regarding mineral mining in conflict areas – alongside its physical ability to be taken apart, hacked, repaired, upgraded and restored. The design ecology of the phone can be viewed across its lifecycle (extraction, production, use, disposal). In extraction, the raw materials of the phone and the social, ethical, political and ecological issues associated with mining depleting resources; in production, the modular and long-life design of the phone and the systems required to support that ambition in terms of component development, retrieval and renewal; in use, the ability for people to repair, update, adapt and hack the phone to best meet their needs; and in disposal, a phone that is modular and easy to disassemble to retrieve a range of resource values through refurbishment, reuse and recycling.

The Fairphone traverses the innovation landscape presented earlier, particularly highlighting manufacturer's responsibilities concerning the ethics of resource management – which may result in context changes such as the governance and regulation of resource use. Its story also connects deeply to people across the product lifecycle. This differs from the traditional manufacturing view of focusing on 'customers' in relation to market research and predominantly in the pre-use stages of the lifecycle. In the case of Fairphone the reality of a longer-life, adaptable phone draws customers into a dialogue about product care and optimising its service to meet individual needs. Such dialogues will occur across the life of the phone and may involve formal dialogues with the manufacturer or service providers or more informal dialogues with communities of repairers and hackers.

Above all Fairphone encourages its customers to engage with its product in a deeper way: to look inside it, to understand the components and their functionality, and to develop the confidence to repair and adapt the product as technology progresses. While the concept of an ethically sourced, repairable and adaptable product is not rocket science, it is a universe away from the trajectory of the smart-tech market characterised by built-in technological obsolescence and maximum sales. By comparison Fairphone represents a new story – an innovation with ecological and social credentials that have influenced its design and its mode of business.

**Figure 2 Fairphone 2: white case and modular design (Fairphone, 2015)**



## Conclusion

This paper proposes that the journey towards sustainability will in part be determined by the ability of designers, through designing the world around us, to make the social and ecological context more evident and meaningful. This gives designers an opportunity to develop new patterns of production and consumption that have the potential to redefine human activity to positively contribute to sustainable change. Products (and other designed forms ) can tell different stories of resource origin, use and reuse; of technology, resilience and economies of wellbeing. These stories are not designed simply to sell more products. Instead they should embody ecoliteracy which needs to be intrinsic to the designed outcome and which can communicate and guide users through lifespan decisions – from processes of co-creation to activities associated with maintenance, modularity, repair and up-cycling. It is through these ecologies of design that we can create future resilience and hope.

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## Images

Figure 1 Innovation landscape: Author's own, based on work from Open University, 2014

Figure 2 Fairphone 2: black matte case and modular design, Accessed from Flickr Album Fairphone 2, 2015, on 03/05/16 at: <https://www.flickr.com/photos/fairphone/23624799326/in/album-7215765422299268/>