

# Seeing sustainable futures: the potential of design education

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# Seeing Sustainable Futures: the potential of design education

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**Abstract**

The process of sustainable development requires us all to think differently about what we do, how we do it and why we do what we do. Questioning activities in the context of sustainability can often result in difficult and perhaps uncomfortable conclusions about our current development paradigm – one that gives primacy to economic growth and wealth creation over welfare and well-being.

The practice of design operates within this development paradigm and is complicit in the unsustainable activities of the business domain. Designers support the economic system through the conceptualisation and production of goods: goods multiplying in variety and number, responding to escalating global demand. Unfortunately most current business operates for economic profit alone, ignorant of key sustainable ecological and social parameters. For example material throughput is linear rather than cyclic in nature; social inequities exist in relation to trade and well-being; and natural resources are considered convenient dumps for pollutants and toxins. Designers, among many others, are thus implicated in the augmentation of unsustainable outcomes rather than the reduction of them.

This paper aims to explore how this situation can be reversed to enable design to play a positive and supporting role towards the goals of sustainable development. Challenging the current paradigm of development will need people who have the ability to think creatively and laterally and draw on disparate areas of knowledge to vision new, more sustainable futures. Design education has a big role to play in this transformation and as such needs to alter its focus from the current outcomes of design activity to a range of alternative responses that embrace joined-up thinking and generate apposite learning outcomes. This paper investigates the sort of knowledge required and discusses the potential shift in values needed for design for sustainability to be accepted as a catalyst for change. It addresses the potential of current design education in channelling such change and investigates the sort of tools required for this to happen. Ultimately, the paper proposes, it is a key responsibility of existing design educators to prepare the graduate designers of tomorrow with the skills and inspiration to vision sustainable futures for this century and beyond.

**Introduction**

*Exploring sustainability*
Sustainable development is a central idea to ensuring our long term survival and prosperity. Because of the complexity inherent in such an apparently simple phrase, it requires original and creative thinking to attempt to tackle some of the key problems we face today. These problems are wide-ranging and include issues such as; depleting natural resources, evidence of increasing social dislocation and exclusion, globalisation and the growing gap between accountability and environmental impact, increased levels of pollution and toxicity and the inherent focus on economic growth as the prime measurement of wealth. These problems focus both on ecological issues such as limits to growth and the value of diversity and also on people-focused areas such as equitable distribution of resources, environmental justice and precautionary behaviour.

A key barrier to the limited take-up of sustainable development ideals is the current lack of understanding that people have of the connections between their day-to-day activities and the ecological impact of these on the planet. This cause and effect relationship between activity and impact has great consequences for the way in which people live their lives, particularly with growing global aspirations towards *increasing material wealth* and associated notions of an increased *standard of living*. However, this current paradigm that encourages a reliance on material things to demonstrate a standard of living is inherently unsustainable. For example, if we analyse trends in population growth we find indicators pointing towards a doubling of global population from the current 5 billion to in excess of 10 billion by 2020 (Meadows et al. 1992). These predictions raise the question 'how to deliver equality of access to resources to provide sustainable lifestyle patterns for all?'

*Values*
Key to this, is the understanding of what *quality of life* really means. Contrary to popular belief, it doesn't equate to standard of living – increasingly evidence suggests that owning lots of things doesn't necessarily make you happy and healthy! Quality of life should be attainable to every single person on the planet given that each individual should be able to meet their basic human needs that encompass survival and development through learning, through creation and through the formation of relationships. We tend to think of basic human needs as purely having enough to eat, shelter and protection but there are a number of others which are fundamental to the holistic development of human beings and by default, their quality of life.

The nine fundamental human needs are:

- Subsistence
- Protection
- Affection
- Understanding
- Participation
- Leisure
- Creation
- Identity
- Freedom (Ekins & Max Neef 1992)

These core needs were identified by sociologist Manfred Max Neef who developed these findings predominately through studying societal groups in South America. He concluded that these nine basic human needs do not change over time, nor indeed in different cultures – they remain constant and relevant to all human beings. However, what does *change is the way in which these needs are satisfied*. And it is the seeking of satisfaction of these needs through the purchasing of *things* that underpins the unsustainable levels of consumption we see in the (so-called) developed countries today. The notion of having things and of being able to buy more things has been culturally linked – in terms of an 'American' or Western culture – to the attaining of an increased quality of life - a quality of life that is embraced – now globally – as the one to aspire to. In contrast to the glamour of these material-oriented lifestyles, other data flies in the face of this prosperity. For example crime rates have risen 8-fold since the 1950s, more people are working longer hours to maintain a decreasing quality of life, the health of people in the UK is decreasing and more marriages are ending in divorce.

It is important to clarify that it is not the process of having things and having ideals about the way one wants to live that is at issue here, but more the unquestioned prominence of one particular culture dominating philosophies of development and prosperity. It is surely appropriate when discussing ideas of sustainable development to question some of the effects emerging from this consumer culture. And further, to question the unchallenged perspective of limitless consumption per capita.

Thus the *big* question behind goals of sustainable development is how can we begin to think creatively about not only providing **different** things for people to consume - things that use less resource, or produce less pollution for example. But also, and perhaps more crucially, how do we convince people to consume **less** through devising alternatives to the dominant culture of owning material things?

This is where design plays a role in the sustainability story.

**The Role of Design Education**

Designers are implicated greatly in the sustainability crisis. Their activities are part of the problem: encouraging premature product obsolescence, product proliferation, material consumption and associated pollution. But also part of the solution: proposing more efficient products and services, non-material alternatives and community regeneration. While the potential for designers to affect positive change is significant – *80% of a product's environmental impact can be reduced in the first 20% of the design process* (Graedel et al, 1995), this has remained largely untapped both within industry and education. For example, in the UK design students rarely introduced to sustainability during their HE experience (Ali Khan, 1996) and when sustainability issues are explored, they tend to be addressed in a one-off, stand alone project or introduced as an 'add-on extra' to a design brief .

Albert Einstein said that you can't solve problems with the same thinking that created them. If this is the case then maybe what is required of design is a different perspective on the subject. An expansion of the parameters of what design is, what it can achieve and ultimately, its potential role in moving us all towards more

sustainable modes of living. I would suggest that this reflection on current design is the role of a new type of design education – a design education directed towards sustainability.

So what is education towards sustainability? Sustainability is much more than a pool of data or information – *it is also a way of thinking*. Consequently any educational process dealing with sustainability has to communicate the subject's essence through ways of learning and teaching. Alongside this, it is also important to develop changes in operations that encourage a more holistic learning environment. For example, the implementation of sustainable practices in university operations such as energy, waste and supply chain management help establish an integrity and support messages of sustainability embedded in the content of learning and teaching.

Building on these ideas, we might suggest that the sustainable remit of universities – in both the philosophy and practice that underpin the educational process are to:

- inspire,
- encourage delight,
- foster fun and exploration,
- discover and share new knowledge,
- devise new connections and links,
- encourage synergies and networks,
- critically analyse, and
- be radical.

If we focus in on the actual process of learning and teaching – we see that the teaching principles and practices of sustainability education (Orr 1994) are based in:

- participation,
- mutual learning,
- multidisciplinary approaches,
- analysing problems from multiple perspectives.

Further, sustainability needs people to develop skills and knowledge, to define problems holistically and to analyse them from many perspectives. So this suggests that in terms of understanding the role played by universities in sustainability education, we need to see these characteristics present.

Interestingly, many of these features are already present in design education:

- learning by doing (commonly 'live' projects)
- iterative and analytical nature of the design process
- solutions-focused learning

The level of similarity of these two teaching approaches perhaps suggests that an entirely new design pedagogy need not be developed for design for sustainability. There are some important additions that would have to be made such as a greater emphasis on life-long learning and an emphasis on mutual learning between and across groups, such as local communities, who traditionally have been seen to be 'outside' design.

1. The theory we generated for demi
2. examples of DfS education - exploration of the demi /MSc examples and projects that emerged

**Knowledge and tools**

This co-development of design and sustainability education was the aim of the demi project that I'm now going to describe to you in a bit more detail.

*The demi project*

demi stands for **design** for the **environment multimedia implementation** project. It began in 1998 and was launched earlier this year.

demi was a consortium project comprising academic organisations, organisations supporting sustainable development and those promoting design. The project was led by Goldsmiths College, University of London which has a tradition of research and teaching in this subject area.

demi is a web-based resource linking design and sustainability. Information about sustainability is complex and dynamic and thus the web is one good way to present this information. However, our experience with the demi project suggests that there are a couple of limitations with 'e-learning'. For example, in design few computers are found in the studio – the place where students do the majority of their work. Also the use of the web as the sole method of delivering sustainability information – without an overall sustainability strategy – both from a course level and an institutional level - is of limited effect.

demi has been developed primarily for the higher education design community - both staff and students – across the full range of design courses… stretching from product design engineering to graphics and from architecture to jewellery and silversmithing.

It is of course relevant to those outside this group – having resonance with design practitioners, community groups, non-governmental organisations, business and also with other academic disciplines.

demi is accessible to you all now. It has been designed to be updated and therefore the hope is that the information within demi will grow over time.

demi not only brings together a large amount of information on design for sustainability but it also suggests new ideas and new ways of thinking. Thereby using sustainability as a *driver for change* in design education.

*The development of demi*

The last decade has seen the promotion of sustainable development education by the UK Government. The 1993 Toyne Report for example, stressed the need for Higher Education institutions to not only introduce sustainability curricula into all courses but

also to make the institutions themselves, their campuses and their purchasing policies, more sustainable.

A few years after the Toyne Report was published, a review of progress was undertaken and revealed that very little progress had been made (Ali Khan 1995). In the design sector, for example, one university alone had specified a learning agenda for sustainability relevant to all students.

The indifferent response of the design education sector to the original Report gave rise to the development of another government document, promoting sustainability concepts; sustainability solutions; and effective teaching relevant to design education – one which formed the basis of the demi project.

So, from the outset, the demi project team was aware that there was still a very long way to go in promoting effective design for sustainability in practice.

And this is not just the picture in the UK either. While theory in this area continues to develop through processes of iteration and debate, what is increasingly obvious is the growing gap between theory and practice. At a recent conference on design for sustainability in Stuttgart, a number of the speakers commented that the theory in this area is now well developed, that education is not far behind but that a huge void exists between what is theorised and what design practitioners actually do. The speakers proposed that bridging this gap is one of the key challenges for the subject area. demi aims to begin to do just this.

demi suggests that there are a range of possible approaches to design for sustainability, extending along a continuum, where the two extremes are characterised by different contexts or starting points for viewing this subject area.

At one end is a design context, where sustainability is 'understood' within the frame of reference of current design activities and priorities, i.e. bringing a product, service or system to the market place (and this is where most current educational practice focuses its attention). Designers for example describe the design/environment interface as establishing paper recycling schemes or turning off the lights. Or they talk in terms of making products durable or choosing more environmentally responsible materials – commonly thought to be natural materials - with no comprehension of lifecycle concerns. And it is important to understand that these are not bad things – indeed, any developments that help to highlight environmental concerns should be viewed positively. However, by *only* looking for sustainability in design, the sustainability outcomes of the design process will inevitably be limited by the existing parameters of design.

At the other end of the continuum is a sustainability context. Here design is viewed as a dimension of sustainability (rather than sustainability being viewed as a dimension of design as at the other extreme) and draws on sets of backgrounds, expectations, priorities and outputs in accordance with the goals of sustainable development. This expands the boundary of what constitutes design, what it does and who is involved by drawing on dialogues, individuals and groups from outside design's traditional confines. This inclusive perspective maximises the potential of design thinking to influence the environmental and social impact of goods and services.

So one of things I'd like to emphasise is the importance of challenging habits and challenging perspectives – *sustainability at it's core requires a change in behaviour*.

From an educational perspective this means we need to explore the world beyond 'the comfort zone' – puncture the traditional 'curriculum', move out into the wider universe and reflect from a different perspective, the changes that design, the designer, and the institution need to make for sustainability to be a reality.

From a practical perspective, the demi team questioned how to make design for sustainability happen, who should be involved and how to communicate it. The question is really one of stimulating interest in a subject that has overtones of worthiness and that seems oppose fundamental ideas embedded in current activities in design.

Design for sustainability sounds life a specialism of design where in fact sustainability is much bigger than design … so it's the other way around. As I alluded to earlier, sustaining design is not the same as design for sustainability – it's not about quantity of stuff and standard of living, it's about quality of life. Sustainability is concerned with connectivity and holism and doesn't sit well within traditional, tightly defined academic disciplines. Its size makes it frightening and difficult to understand. So how do you begin to include these concepts in design education?

Considering these notions of connectivity and whole thinking, the demi team decided that learners first needed to understand some of the basic building blocks of ecology, natural flows and systems. They needed a context to explain the problems associated with sustainability. So for example, they thought it imperative that learners would be able to know the importance of considering peoples' needs and rights in the design process. There was a requirement to think about natural resources and limits to these. To reflect on strategies developed by diverse groups in order to suggest some ways forward and to have ideas about how to move from this very big picture to the smaller scale – to the day-to-day issues of: How do I live? What do I do in work? In other words to suggest different ways of behaving to people through different design outcomes that meet peoples' real needs and make them happy in preference to satisfying insatiable desires. On the one hand the demi team wanted designers to be able to make social comment, and on the other to be able to recognise the environmental benefits of substituting one material for another.

To get a sense of the diversity of information held within demi, it is important for you yourselves to navigate the web-resource, creating your own unique journeys through it. But to give you an idea of a little the scope of the web-resource I will briefly describe some key attributes of demi.

The key to demi is its structure and the connections within this structure. demi contains six core sectors. In essence, these represent an attempt to redefine the sophisticated arguments and complex ideas embedded within design for sustainability in six, more tangible, terms.

- the demi principles

- underlying concepts of design for sustainability
- underlying concepts of sustainable development
- information on materials information and product applications
- debates – information providing a context for the entire web-resource
- a gallery which contains examples of good practice from both companies and student work

As well as there being very different types of information encapsulated within demi – ranging from the general to the particular – the source of the information contained therein also varies. demi doesn't limit itself to 'formal' information sources like that produced by institutions or academic disciplines. It also draws from less formal sources like community groups or environmental organisations.

The connections between sectors are a crucial part of demi. They act as a type of 'translator', on the one hand providing designers investigating sustainability issues with contextual information. So they can see the bigger picture and begin to investigate relationships between impacts on the micro and macro levels. And on the other, the connections suggest starting points from which learners can begin to make sustainability real.

So, for example, the connections will enable users to engage with the reasons why choosing one material over another for environmental reasons, is desirable. They will link issues associated with materials to debates like limits to growth, via principles such as efficiency.

The demi principles translate sustainability issues into a more design-oriented language. They also act as key connectors between information found in the other sectors of the web-resource.

There are six principles and together they represent the ethical, social, economic and environmental components of sustainability. So they concentrate on needs and quality of life and equally have a focus on resource use and efficiency.

The six principles are the product of a long period of consultation with experts and have been through numerous iterations:

EFFICIENCY
Includes concepts of minimisation; reduction – lightweighting, dematerialisation; conservation; renewable resources; recycling; disassembly; lifecycle thinking; durability – life extension, customisation; reuse – cascading; material and waste flows - waste management

SYSTEMS
This principle looks at ecosystems; cause and effect; regeneration; lifecycles; industrial ecology; Gaia; permaculture; thermodynamics; the natural step and interdependency of major systems.

EQUITY
This principle covers a range of issues; geographical, procedural and social inequity; democracy; environmental justice; environmental degradation; racial and gender discrimination; valuing the environment; green economics; fair-trade; inter-generational equity and quality of life for all.

SCALE
Scale involves thinking about the relativity of particular parameters ... without a perception of scale we cannot perceive the size of consequences of action. Includes issues of time-scale for environmental improvement; local and global; issues of growth; the inherent scale-linking of nature's processes; small is beautiful; industrial vs. craft; and centralised vs. decentralised ...

SUFFICIENCY
Discusses fundamental human needs and the material and non-material satisfiers of these needs (of the nine fundamental human needs, only two of these need to be addressed through the use of material). The principle of sufficiency addresses quality of life in comparison to standard of living, and explores ideas of money and wealth and looks at what the index of sustainable economic wealth (ISEW) measures compared to that of GNP. A discussion of consumption patterns and lifestyles is also prevalent.

APPROPRIATENESS
Appropriateness focuses on fitness for purpose highlighting the need for balance between the potential of the materials and energy to task. It addresses appropriate technology; issues of participation and inclusiveness; embracing differences; sharing interactions and gaining new knowledge; acknowledging meaning within products; and embracing identity – culture and geography within design solutions.

The demi principles act as a useful starting point for engaging with issues of design and sustainability and whilst not exhaustive, they do provide, if you like, a core index to understanding the scope of design's role towards sustainable development.To explore demi more, please access the website at **www.demi.org.uk**. If you'd like to contact the demi team then please email **info@demi.org.uk**

**Conclusion**

Key points - the design education agenda for the 21st century.

And finally, I'd like to again emphasise the importance of challenging habits and challenging perspectives in design education in order to provide opportunities for design for sustainability solutions to emerge. Sustainability, at its core, requires a change in behaviour. I have illustrated today that design education also needs to embrace change: a change in its reference points, its expectations and its connections with other disciplines. I would suggest that there is huge scope for mutually supporting

relationships between design and sustainability, with new design solutions emerging in response to the sustainability challenge.

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