



## **DEEDS: a new Teaching & Learning resource to help mainstream sustainability into everyday design teaching and professional practice**

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### **Abstract**

The DEEDS (DEsign EDucation & Sustainability) project, funded by the European Union Leonardo da Vinci Programme, comprises a partnership of five institutions from the European design and sustainable development communities, embracing Higher Education, research and practice. This paper outlines the background, evolution and outcomes from the project which currently include a set of core principles, SCALES, diverse resources available via a web site, an evolving Teaching & Learning landscape of 'pods' (the Pod-scape), new student projects, and more. DEEDS has embraced a platform of mutual learning by engaging diverse members of the design communities, with various actors and stakeholders to create a participatory platform for embedding 'sustainability into design and design into sustainability'.

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# 1. Introduction & background

The first post-modern design manifestoes referencing ecological imperatives emerged in the 1960s (Jencks and Kropf, 1997). Green and ecological design in the late 1980s evolved into eco-design and Design for the Environment (DfE), with an emphasis on eco-efficient ways of designing. By the late 1990s, the canon moved on as Design for Sustainability (DfS) gained credence. DfS in this context is understood as comprising a wider spectrum of objectives, adding a social, institutional and ethical dimension to eco-design. Sustainability in this view is a complex concept involving four axes or dimensions: environmental, economic, human/social and societal/institutional [Fig. 1], making it probably the most difficult governance orientation ever suggested (Spangenberg et al., 2002). Little wonder then, that DfS, 'sustainable design', or 'sustainability design', still lingers on the outer boundaries of design education and practice (see for example in the UK, Otto 2003, Richardson et al 2005; in Denmark, ICIS/University of Lund survey 2005). Observing this lack of progress led the International Centre for Innovation and Sustainability (ICIS) in Denmark, to see the need for a transition solution and apply to and receive funding from the European Commission Leonardo da Vinci community Vocational Training Programme to set up the DEEDS (DEsign, EDucation & Sustainability) project. DEEDS comprises five partners: ICIS, SERI (Sustainable Europe Research Institute Germany e.V.), BEDA, (Bureau of European Design Associations), University of Brighton and the Academy of Fine Arts, Poznan from five EU countries, Denmark, UK, Germany, Poland and Belgium. DEEDS primary aim is to 'Integrate Sustainability into Mainstream Design Education and Design Practice in the EU Countries' by improving the skills and competences of design educators and practising designers, and the quality of, and access to, continuing vocational training for the target groups. The aspiration is that DfS can be inspired, inspiring and innovative in helping, through and with design, to deal with sustainability issues that figure prominently in the public and political domains, and help the EU meet its strategic sustainability objectives expressed in the EU Treaties.

Indeed, DEEDS activities are already influencing the EU policy agenda with the better integration of sustainability into BEDA's lobbying role and its potential inclusion as a fundamental component of the design policy for Europe which BEDA is currently working towards with the European Commission.<sup>6</sup>

The final outcomes of the DEEDS project will encompass an open source website and a manual including case studies, educational models and methods, tools and skills which will demonstrate and teach DfS to the target groups.

## 2. Early phases of the project

Early research sought to understand (by literature survey, questionnaires and workshops) the barriers and needs to implementing sustainability beyond rhetoric for the two key audiences, design teachers in Higher Education and designers in professional practice. This process guided the early development of the web site, (DEEDS, 2007-

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<sup>6</sup> Following BEDA's meeting with EU Commission President Barroso and Commission Vice President Verheugen in October 2007 and January 2008 respectively, the Commission has indicated that it will produce a 'Communication on Design' in 2009.

2008) generating a platform for presenting theory and T&L models. Concurrently, DEEDS set about determining the underlying principles that might guide the creation of a Teaching and Learning resource for these audiences. DEEDS believes that sustainability is complex and holistic requiring people to understand, imagine, design and solve problems together or in synergy, addressing the different aspects and interrelated levels of the contexts involved (see for example Fuad-Luke; Manzini; Walker; Wood in Chapman & Gant, 2007; Wood, 2006; Manzini and Jégou, 2003).

### **3. Needs & barriers of key target audiences**

The UK Design Council's report (Richardson et al., 2005) highlights the typical barriers, real and perceived, cited by design practitioners and educationalists [Table 1]. Their findings for educationalists are supported by Dawe et al (2005) who identified four major barriers to the successful embedding of Education for Sustainable Development, ESD: overcrowded curriculum; perceived irrelevance by academic staff; limited staff awareness and expertise; and limited institutional drive and commitment. Evidence from architectural design, for instance, noted various barriers & obstacles (Fowles et al., 2003):

- The professional bodies, ARB/RIBA, acknowledge sustainability in their validation criteria but it is compartmentalized and relegated to technology subjects rather than integrated into professional practice and/or a cultural context.
- Design tutors tend to have a defensive attitude towards sustainability, especially in areas where they don't have the expertise.
- Architectural design educational culture tends to encourage the expression of the ego through formal design, whereas more emphasis needs to be placed on societal and global needs.
- Sustainable design is tangential to rather than embedded in mainstream architecture.

Iball (2003) found that many post-graduate courses in architecture emphasized technical and quantifiable environmental issues, but neglected a wider, more holistic, educational response in environmental, social, economic and cultural terms as needed for substantial sustainability. The same general observation was made during worldwide (English speaking) survey of post-graduate courses in eco-design/sustainable design with a product orientated focus (ICIS/University of Lund, 2005).

The authors of this paper have experienced a variety of responses when giving lectures about DfS from well-renowned design colleagues, i.e. comments like 'teaching DfS is a dogma which does not further creativity'.

There seems to be a myth attached to 'sustainability issues in a design context' among many design students, teachers as well as professional designers, which places sustainability in a box of non-creativity, restrictiveness, 'old hat' and other metaphors from previous decades.

An invited panel of external critics, comprising design practitioners and educationalists attended a workshop in Brighton, UK in May 2007 (DEEDS, 2007) and

with the Partner team, together defined the barriers [Table 2] under the socio-cultural, political and economic categories of money, structural/institutional, education, consumers and cultural temperature/human values. They also invoked the 'silent witness' of the neglected environment, aka nature. This collective perception of the barriers clearly demonstrates that the task of mainstreaming sustainability into design will inevitably require professional *and* personal transformations in thinking and behaviour.

This idea was further supported by the findings of the survey conducted by the Bureau of European Design Associations (BEDA) which was targeted at practicing professional designers. To reach this audience, (no survey was conducted of either design schools or client companies), BEDA surveyed its professional design association members across Europe (20 members of a total of 39). The questionnaire comprised only 4 key questions (being mindful of how difficult it is for practising designers to find time to complete a questionnaire) and it was issued in Danish, Dutch, English, French, German, Italian, Spanish and Slovenian to increase the response rate. The questionnaire is set out in full at Appendix 1. 283 individual responses were received from 14 European countries (listed at Appendix 2). The breakdown by design discipline is at Appendix 3 and some analyses of the questionnaire are given in Table 3.

From the responses received to the Question 3, "As a professional designer, what do you believe are the greatest barriers to practicing sustainable design?", (where a score of 1 indicates no barrier and a score of 10 indicates a significant barrier), it could be inferred that the three key barriers to the application of DfS/Sustainable design set out in the question did indeed resonate with respondents.

Just under 50% of all respondents scored 6 and higher for the barrier, '*lack of knowledge of designers*' with the largest number scoring on 5 (22.3%), perhaps indicating that whilst designers feel their own knowledge to be insufficient, they are hesitant to be too critical of their own practice [Table 3a]. Only 28% suggested that designers have adequate or sufficient knowledge, (scoring between 1 and 4).

On the other hand, for the barrier, '*lack of knowledge of clients*', [Table 3b], 75% of respondents scored 6 and higher with just over 24% scoring 8 and 21% scoring 10, perhaps indicating that the profession as a whole perceives the client's knowledge of sustainability issues to be inferior to its own and the clients' lack of knowledge to be a greater barrier to sustainable design practice than their own lack of knowledge.

Regarding the barrier, '*lack of training at design school*' [Table 3c], just under 63% scored 6 and above with the largest percentage (nearly 19%) again sitting on the fence and scoring 5. These two scores combined total 81.5% of the respondents scoring 5 and above – thus expressing their perception of the need for better training of sustainability issues at design school, (indeed just over 16.5% scored 10 – quite a large percentage thus perceiving design school training to be inadequate).

The questionnaire (Question 2) also provided some insight on the profession's view of its own access to tools and process to support the implementation of sustainable design practice [Table 3d], where a score of 1 represents, 'we have no tools and processes', and a score of 10, 'we already have sophisticated and proven tools and processes', only 3.83% scored 10. Indeed, only 36% of the respondents scored 6 and higher with the largest group (24.4%) scoring 5. Nearly 28% scored between 1 and 3

with a total of just over 64% scoring between 1 and 5. This infers that whilst designers believe they have some knowledge of design for sustainability, they are both less confident about developing tools and processes to facilitate the implementation of that knowledge, or do not know where to find them, (or that their perception is that the tools are few and/or simply do not exist).

A picture was gradually emerging concerning the needs of the DEEDS target audiences. The importance of understanding the motivation and incentives was paramount [Table 4], as was the importance of 'value addedness' of sustainability in the design context. While there were varying lexicons to describe the different target audiences, the promise of something new, inspiring and innovative that improved future job prospects seemed common benchmark incentives.

Most users of the DEEDS web site and resources want something they can immediately use to create 'positive impact' (answers; tools; solutions; examples). They also want to be empowered with new competences – a serious challenge, as this often neglects the learning need associated with developing a broader, sustainability-based approach.

Design educationalists/teachers can be motivated and attracted to sustainable design by helping them to reduce their workload, giving them new methods and T&L learning models while enhancing their status and job satisfaction by adding new dimensions and challenges to their intrinsic assessment and evaluation criteria.

For design practitioners to be motivated to learn about and implement sustainable design practices they need to see a clear connection to an increased potential for business growth. Design companies need to be able to demonstrate greater added-value for their clients, as well as gaining benefits for their own companies in terms of better-quality projects and outcomes. They need to see the link to the increased turnover (preferably with improved profit margins). Where they see a powerful additional ingredient to their offer, (supporting distinctiveness in a very competitive marketplace and /or aligning with the procurement policy requirements of sustainability aware clients), designers will be more easily attracted to integrating sustainable design into their every-day practice.

Design students can be motivated and attracted to sustainable design by showing them how it improves their employability and challenges their creativity by widening their horizons.

Two hypothetical examples demonstrate how needs can be met by understanding the barriers and motivation:

#### Teachers & students

Motivation: HEIs (Higher Educational Institutions) are often cash poor. Teachers need to look for external funding and yet are also trying to get work experience/placements for their students.

Means to overcome barrier: By finding an external client that would partner in setting a competition for the students, generating positive outcomes for the teacher and the client.

#### Designers

Motivation: Materials, choice of materials are central to how a designer operates.

Means to overcome barrier: By re-positioning and re-educating about 'sustainable materials' – where aesthetic, form, properties, and cost can be set against environmental & social costs; where it can be demonstrated that choice of a 'sustainable material' saves their clients money and is an important task demanding awareness of a wider context.

## 4. SCALES, the core principles for the DEEDS T&L approach

DEEDS derived a generic systematique of themes reflecting the complexity and multi-dimensionality of the sustainable development concept, 'SCALES', that need to be addressed when considering how design can positively impact on sustainability (DEEDS, 2007; Spangenberg et al., 2007).

SCALES is a complementary set of 24 principles based on:

- Skills (S – nine principles = 3 x 3 principles)
- Creating change agents (C - 3 principles)
- Awareness – systemic and context (A – 3 principles)
- Learning together (L – 3 principles)
- Ethical responsibilities (E – 3 principles)
- Synergy & co-creating (S – 3 principles)

SCALES was compared with other systematiques for ecological and sustainable design published since 1968 [Table 5]. The foci for manifestoes up to 1992 was largely around a holistic approach, awareness of system and context, and eco-efficient production and resource use. Post 1992 more emphasis was given to ethical responsibilities, ideas of learning together, and synergy and co-creation. The DEEDS principles embraced additional focal areas – the importance of communication and leadership, user empowerment, social aspects and the creation of change agents – and appear to be the most comprehensive set of guiding principles addressing the challenge of designing for a sustainable future(s). Later SCALES was exposed to critique in workshops by design teachers, and their students, and design professionals leading to their current iteration on the DEEDS web site. (DEEDS, 2007-2008):

#### Skills

DEEDS points to different skill sets:

Special skills- the holistic approach: Vital for the DfS process is the context, the interrelatedness of the different levels and aspects of the design problem and processes. It is important therefore to define and analyse problems from multiple perspectives including the four dimensions: economic, social, institutional and environmental.

Special skills related to eco-efficient and eco-effective production and resource use by developing LCT, LCA and cradle-to-cradle skills, become familiar with technological advancement, dematerialisation, zero carbon considerations, new and sustainable materials, and, waste considerations. Of equal importance is the integration of efficient service provision by designing Product-Service-Systems (PSS) and maximising consumer satisfaction by appropriate material/dematerialised option that expands user experience, emotion, relation, pride, self-esteem and awareness.

Finally special skills related to communication issues as well as leadership, are vital for the advancement and integration of sustainability practices in societies. Designers to become leaders, capable of communicating and presenting the contexts, the considerations, the pros and cons, working with clients, customers and other relevant disciplines such as engineers or economists. Making a real impact by understanding the context and culture of the stakeholders, and be able to demonstrate and communicate the importance and advantages of sustainability.

### **Creating change agents**

This principle encompasses the understanding of the expanded field of design and its processes when implementing sustainability. The designer, in particular by using the networks (s)he commands and by fully understanding and communicating the value-added outcomes of DfS, becomes the change agent and also equips the client to become a change agent, yielding first-mover benefits. This can be achieved by using approaches which provide significant, immediate and visible benefits for the client and consumers/society through CSR, ethical consumer behaviour, cost cutting, competitive edge, waste and energy reduction.

### **Awareness – systemic and context**

Awareness is step one in DfS. Conscious choices re design concepts, production processes, materials, energy usage, generation of waste and end-of-life scenarios are the first real steps a designer can take. To design in context, be aware of connections and consequences is a precondition for providing maximum consumer satisfaction with a minimum of negative environmental impacts (even in mass production) and a positive balance of social effects. For this behalf, positive and negative impacts, feedback loops and side effects must be taken into account.

### **Learning together**

Sustainable design is based on co-creation, co-design, synergistic learning. Social innovation practiced and promoted more and more by designers is only possible through mutual learning, team working, inter-and trans-disciplinary thinking and practice. Reciprocity, T&L through participation involving stakeholders, form the foundation of sustainable solutions. More and more design companies engage in this way of designing, where the designer becomes the facilitator rather than the creator of design solutions – a challenge to design's collaboration and communication capabilities.

## Ethical responsibilities

An ethical design company creates design solutions that do no harm (responsible design, with integrity), but contribute to a sustainable way of a “good life”.

An ethical design company offers design that enhances personal standing and acceptance, and thus social sustainability and encourages user involvement (consumer empowerment). It develops practical, functional and fun design (experiences not objects)

The ethically responsible design company is no longer a figment of the imagination of design visionaries, but a concept which design companies will have to decide to embark on sooner rather than later. As CSR (Corporate Social Responsibility) is becoming an integral part of company’s culture and business in general, the design company will have to follow suit in more than wording or could loose potential clients/market.

The professional design associations have the opportunity to promote sustainable design practice through their individual members across Europe. Indeed there is evidence that some are already incorporating sustainability criteria as a requirement of membership and it is hoped that this trend will continue to grow.

## Synergy & co-creating

The imperative is to engage in synergistic collaboration. Competence clusters are practiced with great success by a number of companies in the EU. Partnerships, collaboration, sharing and including stakeholders in development of design solutions are essential elements in the implementation of sustainability and DfS. Therefore, it is necessary to engage the client, the suppliers, the consumers and the community.

SCALES offers a most comprehensive set of criteria that:

- embraces the scope of previous criteria yet adds new ones found to be essential when understanding DfS as a broader challenge than DfE;
- can be easily adapted and 'owned' by an individual or a group, initiating a process of learning by doing;
- can form a reference point to demonstrate how case studies embed the principles;
- allows for each principle to become the basis of a teaching module and/or an example case study;
- provide a philosophical and practical foundation for a pluralistic approach to developing DfS T&L pedagogy and practical tools serving as a benchmark.

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## 5. The Pod-scape

Within the guiding ethos of SCALES and its inherent complexity, using the knowledge the project partners have collected about their target audiences, the DEEDS partners are developing a concept for a web-based Teaching and Learning (T&L) resource involving 'pods' that are located within a 'pod landscape' or PodScape.

We envisage that the PodScape will comprise the widest possible range of contributions, including resources relating to:

- pedagogic research, theories, approaches, and experiments in sustainable design education
- the practical implementation of sustainability in design education (e.g. project work, case-studies, best practice, partnership with industry);
- political, institutional, and philosophical aspects of sustainable design education.:

Pods can be created by DEEDS or by web visitors using a guide that encourages the creators to consider the new thinking, behaviour, practical outputs and experimental forms including concepts, prototypes and one-offs. Each pod is 'tagged' with information that enables other pods and other parts of the landscape to be connected, revealed and/or explored at a macro or micro scale and users will be able to navigate the PodScape according to their specific needs, either slowly, quickly, randomly or co-operatively, enabling learning by doing, by experiencing and/or by participating.

## **6. A new Unit of Study at the University of Brighton**

As an outcome of involving various design disciplines in the on-going dialogue within the DEEDS project, a new Unit of Study (UoS) is being created in the architecture programme of the School of Architecture and Design at the University of Brighton. The envisaged 'Sustainable Practices' unit will be an integral part of the undergraduate curriculum in architecture. The motivation for introducing this new unit comes not only from the increasing awareness of the importance and potential benefits of DfS education amongst lecturers, but the growing demand by students to bring sustainability thinking into design education in a holistic fashion – as a positive, generative principle rather than an afterthought. Consequentially a group of lecturers has begun to think about ways in which existing, but isolated DfS teaching elements and expertise in various subject areas (studio-design, technology, history and theory) could be inter-linked, expanded, and turned into a common ground for future DfS teaching. The new Sustainable Practices unit is a first step in this direction: it will be staffed by tutors from the different areas, with additional input from programme-external lecturers; it will enable students to develop a holistic and creative understanding of sustainability in design; and it will act as a catalyst for the development of new, sustainable forms of design teaching across the programme. The unit will also work with, and contribute to, the PodScape. Importantly, these efforts are part of a fast growing movement across the University that promotes sustainability thinking in general and the integration of ESD into the curriculum in particular, and has led to the recent establishment of a University-wide Sustainable Development network.

## **7. Co-design at the Academy of Fine Arts, Poznan**

Students have been engaged in several projects to test T&L approaches within the DEEDS project, in particular the co-design approach, and tools, such as the LiDs or eco-strategy wheel (van Hemel 1994). Co-design is seen as a design approach involving participation of various actors and multi-stakeholders in the design process that is starting to be applied to commercial and social projects (Fuad-Luke 2007, pp38-43; Thackara 2007, pp70-73) Co-design is '*predicated on the concept that people who ultimately use a designed artifact are entitled to have a voice in determining how the artifact is designed*', (Carroll 2006).

Second, third and fourth year students commenced a project entitled 'Humanizing Space', in cooperation with the Poznan International Fair, in which they applied sustainability techniques to the design thinking. The project site concerns a new public space linking the four halls at the Poznan International Fair exhibition centre. Recent revitalization has made it possible to achieve a roofed space, where an existing avenue of linden trees was retained untouched. Architectural design concerned spatial arrangement and merging the elevations of existing, recently rebuilt halls, which have different dimensions and which were built in different periods. The whole area has been covered with a glass ceiling of an interesting construction.

However, the area achieved does not fully measure up to the expectations, and the objectives, and the functional arrangements are unclear and complicated. The whole project requires a clear, holistic design conception of the interior, which would allow effective use of the new conditions to improve the comfort of the users. To this end the students undertook a survey of the site and interviewed many of the stakeholders involved in order to obtain their input into generating appropriate design briefs for interventions in the space that would help humanise it. Detailed designs were generated by the students who later applied a modified LiDs wheel to improve the eco-efficiency considerations of their concept designs. Student outcomes [Figs. 2a, 2b] demonstrate that 'the sustainability context expands the boundary of what design is, what it does and also who is involved....' (Fletcher & Dewberry 2002).

The project is one of three parallel eco projects at the Academy of Fine Arts in Poznan, It helps to change the awareness and sensibility for the sustainability thinking among students, young professionals and the teaching staff.

## **8. Concluding observations and remarks**

This paper provides an interim snapshot of the basic approach and some of the achievements to date in the DEEDS project. It is expected that more substantial content will be uploaded to the web site by the time this paper is delivered. The observations and remarks to date should be seen as a work-in-progress. However, the DEEDS project is a significant positive development in the evolving story of Design for Sustainability (DfS) teaching and practice. It embeds an approach predicated on the idea that participation by designers with each other and with a variety of actors and stakeholders, is key to maximizing the value-added that design can offer to the socio-economic and political journey towards more sustainable ways of living and working, while helping to regenerate the environment, strengthen social cohesion and fostering international justice (the latter being the economic/institutional dimension of sustainability). The power of the DEEDS project is that it has evolved through a process

of *mutual learning*, between the partners themselves, and between the partners, target audiences and other stakeholders. This has generated some positive complementary outcomes - an extensive set of principles (SCALES); a diverse and growing set of resources on the DEEDS web site (DEEDS, 2007-2008); changes in T&L practice at the two Higher Education partners in the DEEDS project; and a participatory T&L landscape, the Pod-scape. At the root of this on-going process is the belief that the diverse design communities of Europe all have something to contribute to the understanding of the potentiality of '*embedding design into sustainability and sustainability into design*'.

In order to encourage dissemination of the results of the DEEDS project, and to encourage wide use of the resources generated, there are a number of key conferences and events in Copenhagen, Denmark (October 2008) London, UK (Sept 2008), Brighton, UK (Sept 2008), Poznan, Poland (October 2008), and Brussels, Belgium (November 2008). The challenge is to get the designers of Europe involved through these events or by accessing and contributing via the web site. While the European Union's Leonardo da Vinci funding for the project finishes in October 2008, the partners' intention is for the DEEDS project to continue to grow beyond the life of the project itself through increased participation. It is their hope that, in the near future, DEEDS can become a home for a better-informed, Europe-wide understanding of the significant opportunities for design that exist through embracing and integrating sustainability behaviours and know-how, which in turn, will help to future-proof those who contribute to the design industries and design communities both in Europe and beyond.

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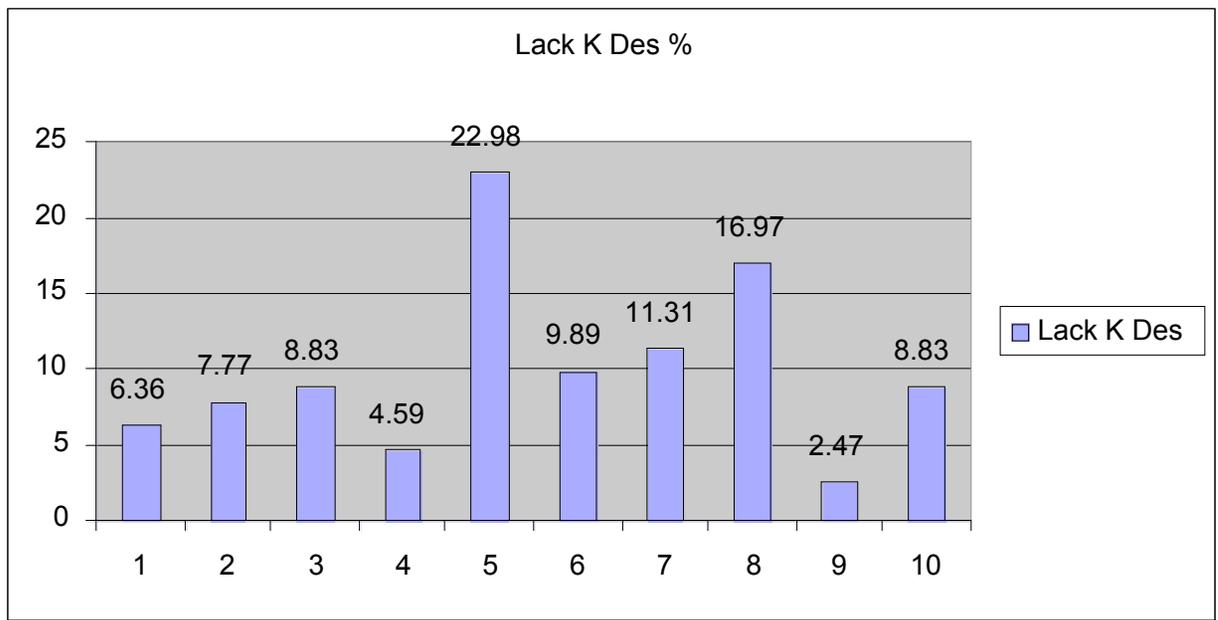
Table 1. Perceived and real barriers to designers and design educationalists applying sustainable design, after Richardson et al (2005).

<p><b>Barriers for designers</b></p> <ul style="list-style-type: none"><li>• Requires larger skill set</li><li>• Designers not in influential positions</li><li>• Unpopular/misunderstood</li><li>• 'Tough sell' to consumers/clients</li><li>• Perception of higher cost of Sustainable Product Design (SPD)</li><li>• Lack of appropriate tools/methods</li><li>• Lack of government support</li><li>• Lack of consumer demand</li><li>•</li></ul>
<p><b>Barriers for design educationalists</b></p> <ul style="list-style-type: none"><li>• Low level of student demand</li><li>• Low level of HE institution interest, understanding &amp;/or perceived importance, therefore little support</li><li>• Low level of business demand</li><li>• Low level of government support to encourage demand/curriculum change</li><li>• Broad and specialist skill set (30 listed skills)</li><li>• No or poor track record of graduate employment as sustainable designers</li><li>• Lack of stature for design in the marketplace</li><li>• Sustainability currently not seen as part of mainstream design education</li><li>• Lack of appropriate tools/models and/or formal knowledge sharing network to aid students/practitioners</li><li>• Lack of skilled lecturers/tutors</li><li>• Lack of entrepreneurial know-how</li><li>• SPD requires lifelong learning</li><li>• Knowledge exchange network poor beyond specialist individuals and centres</li><li>• Poor eco-literacy in school students</li></ul>

Table 2 - Barriers/obstacles perceived by DEEDS and external critics

<p>Money</p> <ul style="list-style-type: none"> <li>• Ambition...</li> <li>• Vision...</li> <li>• Growth (economic)</li> <li>• Economic focus on mainstream/ideological ignorance</li> <li>• Lack of resource, time/money</li> <li>• That it costs more</li> <li>• Lack of critical mechanism to identify SD priorities</li> <li>• IP data methods, adendas, funding</li> <li>• Economic-political system/structures/values</li> <li>• Perceived risk by business and self-regulation that pre-empts legislation</li> <li>• Producers and manufacturers have to invest</li> <li>• Risk for the companies to invest and re-think</li> </ul>
<p>Structural/institutional</p> <ul style="list-style-type: none"> <li>• Synergy...</li> <li>• Process...</li> <li>• Limited capacity to risk 'out of the box (Designers)</li> <li>• Lack of institutional support</li> <li>• Lack of (democratic) participation</li> <li>• Vested interests, 'silos' wih power</li> <li>• Glass boxes</li> <li>• No time (ICT overload?)</li> <li>• Perception is fear/frustration not fun/fulfilment</li> <li>• Too many fragmented initiatives</li> </ul>
<p>Education</p> <ul style="list-style-type: none"> <li>• Lack of knowledge</li> <li>• Quality and dissemination of information regarding resources &amp; impacts</li> <li>• Schooling vs education</li> <li>• No knowledge about sustainable thinking/living</li> <li>• Lack of 'confrontation'/'visceral awareness'</li> <li>• Lack of feedback at the point of consumption and hard to analyse remote impacts</li> </ul>

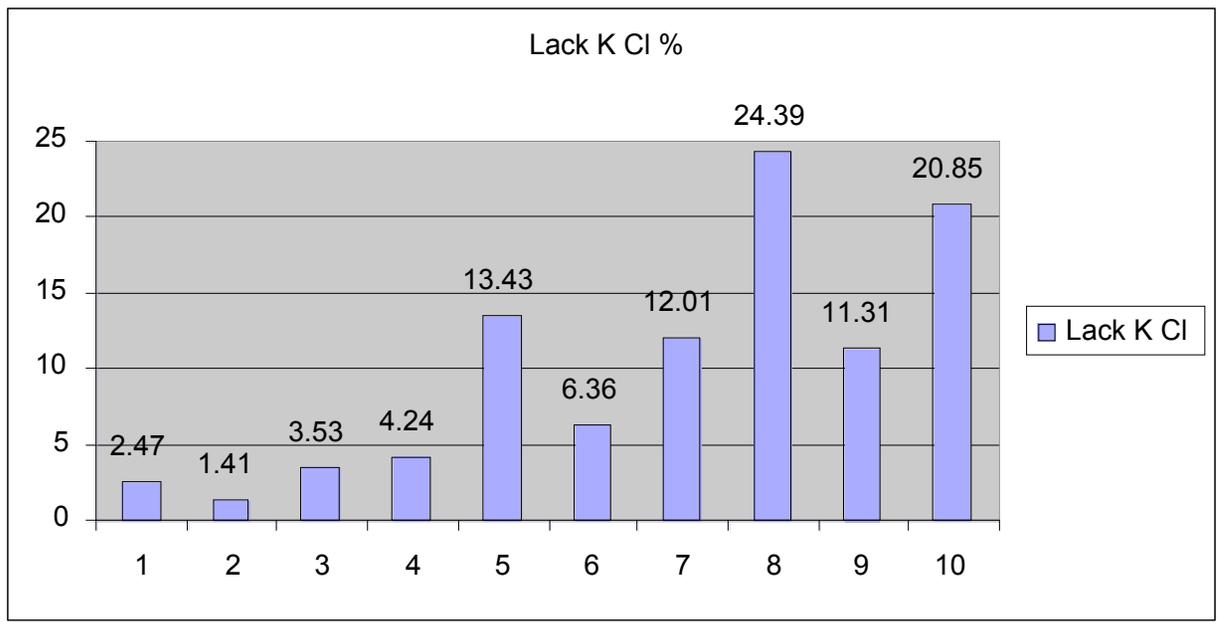
Table 3a - BEDA survey of design associations' members – Scores against, 'Lack of knowledge of designers'



Score 1 = no barrier; Score 10 = considerable barrier

Response Expressed as percentage

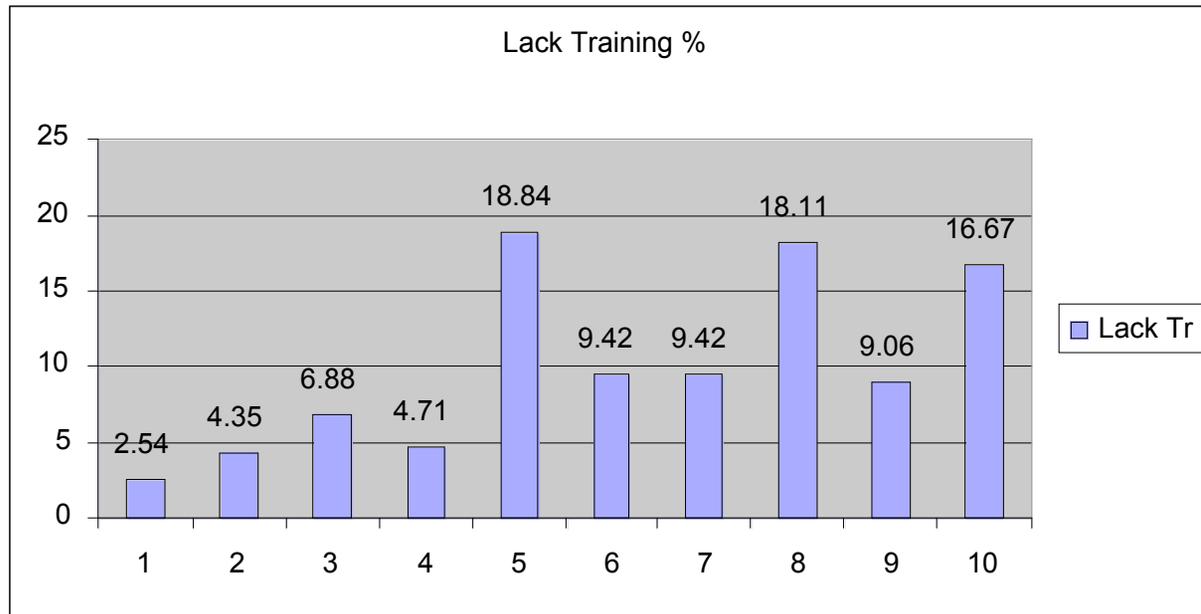
Table 3b - BEDA survey of design associations' members – Scores against, 'Lack of knowledge of clients'



Score 1 = no barrier; Score 10 = considerable barrier

Response Expressed as percentage

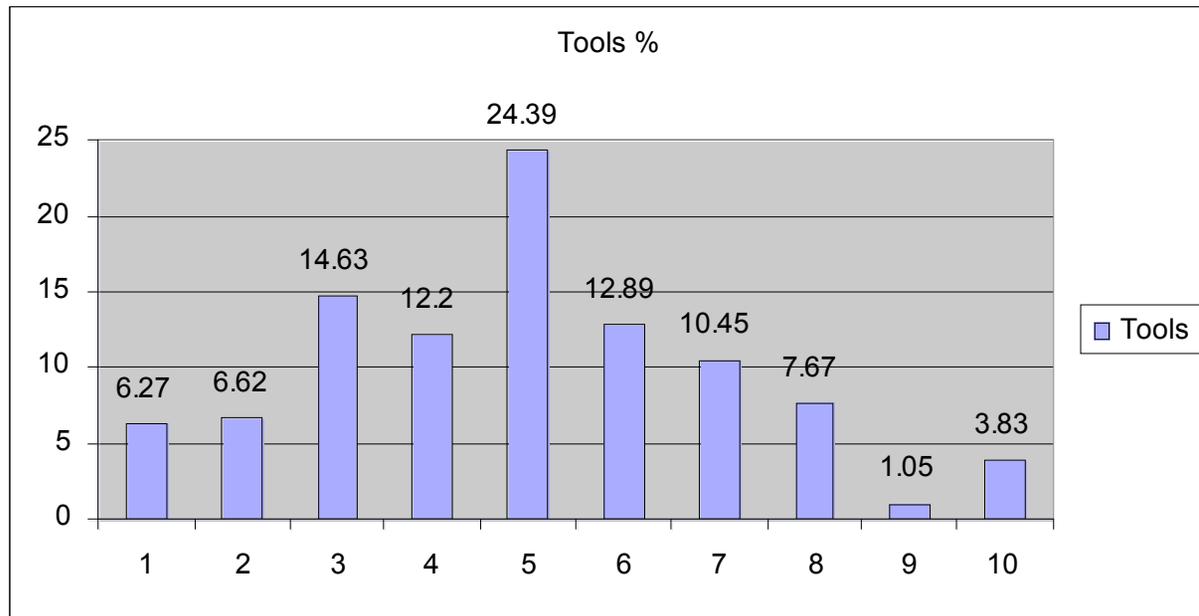
Table 3c - BEDA survey of design associations' members – Scores against, 'Lack of training in design schools'



Score 1 = no barrier; Score 10 = considerable barrier

Response Expressed as percentage

Table 3d - BEDA survey of design associations' members – Scores against, 'Necessary tools and processes'



Score 1 = I/we have no tools and processes; Score 10 = = I/we already have sophisticated and proven tools and processes

Response Expressed as percentage

Table 4 Incentives for target audiences to adopt sustainable design

<p><b>For Designers:</b></p> <p>'Beauty' The other shoe (insight) A new aesthetic for the 21<sup>st</sup> century All at once: 'Beautiful, smart, functional, sustainable' The business case From product to service relationships Deep breaths happily taken – happier practice Competitive advantage CV points Additional transferable skills Original, inspired, innovative A new space to play in</p>
<p><b>For Teachers &amp; students:</b></p> <p>Education v schooling Raising awareness Creative expression without harm Guide for the future Design=art=architecture for society Greater employability Fairness, equity Improve skills + increase knowledge &gt; good life Chance for better education=chance for a better life</p>
<p><b>For Students:</b></p> <p>Education v schooling Teaching the young Trigger systemic change Raising quality of design Greater employability Co-operation and rationality Reframe the status quo</p>

Table 5. Comparison of DEEDS core principles with previously published green design, eco-design, ecological and sustainable design systematiques

Date Author	Special Skills									Creating change agents	Awareness – systemic & context			Learning together			Ethical responsibilities			Synergy & co- creating				
	Holistic approach			Eco-efficient production & resource usage			Communication & leadership																	
	S1	S2	S3	S4	S5	S6	S7	S8	S9														C1	C2
1968 McHarg	X	X	X								X	X	X	X	X									
1984 Todd & Todd	X	X	X	X	X	X							X	X	X									
1986 John Elkington Associates	X	X	X	X	X	X							X	X						X				
1991 Team Zoo Atelier Zo	X	X	X	X	X	X							X	X	X									
1991 Vale & Vale				X	X	X																		
1992 McDonough	X	X	X										X	X	X	X	X	X	X	X	X	X	X	X
1996 Burrall			X	X	X	X								X										
1996 van der Ryn & Cowan	X	X	X	X	X	X							X	X	X	X	X	X				X	X	X
2001 demi			X	X	X	X							X	X	X	X	X	X	X			X	X	X
2002 Fuad- Luke		X		X	X	X					X			X		X	X	X	X			X	X	X
2004 RIBA				X	X	X													X					
2004 Pre	X	X		X	X	X													X		X	X	X	X
2004 Ryan				X	X	X								X										
2007 Chochinov	X	X	X	X	X	X							X	X	X				X	X	X	X	X	X

Phrases, or words, that the above sources mentioned but that are absent from the DEEDS core principles :

Bio-regionality, diversity, symbiosis, fitness/fitting, emotional – senses, balance, humanizing designs, respect for place/site, respect for users, humanity and nature co-existence, respect for material & spiritual connections, safe objects, understand limitations of design, humility, responsive to locality (place & people), regenerate don't deplete, make nature visible, involve all stakeholders, design adaptable to future needs, identify and satisfy real needs, ask 'why?' and 'why not?', preserve and restore 'natural capital', move from products to product-services.



Fig. 1 :The 'sustainability prism'. Source: European DataBank Sustainable Development, <http://www.sd-eudb.net/> accessed May 2008

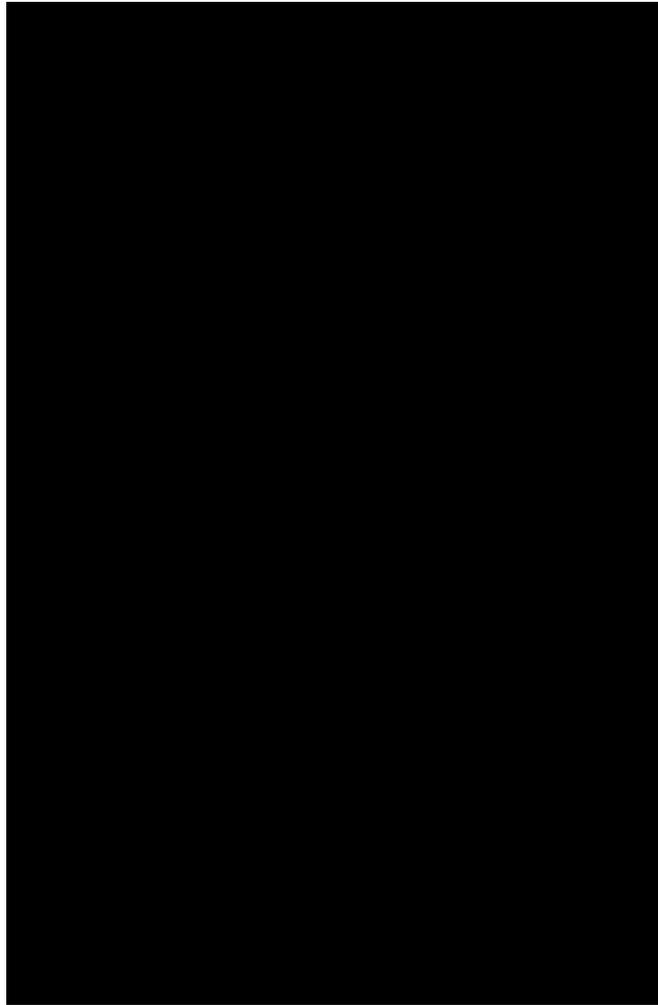


Fig. 2a: Humanising space: Design concepts generated by a co-design approach for interventions

in a public space at the Poznan International Fair, Poznan, Poland

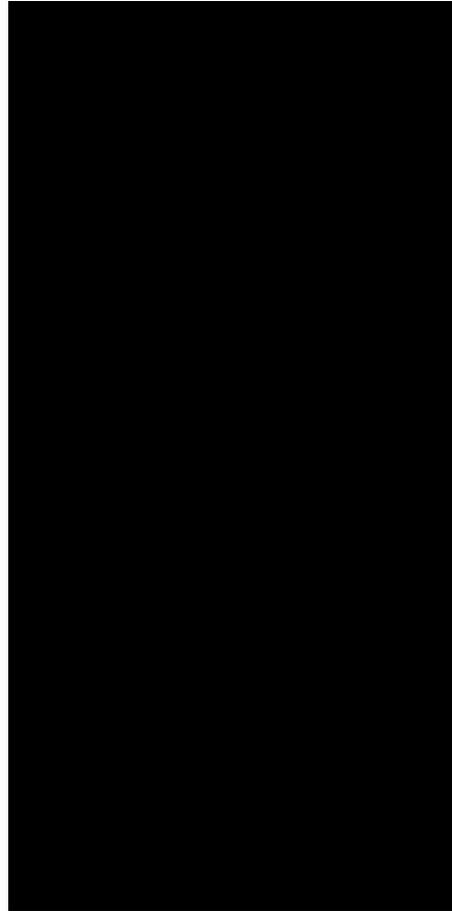


Fig. 2b: Humanising space: Design concepts generated by a co-design approach for interventions

in a public space at the Poznan International Fair, Poznan, Poland

**APPENDIX 1** BEDA questionnaire on behalf of DEEDS. – May 2007

**DEEDS – A European project to create tools and processes for the development of more sustainable design practice across Europe. Embedding sustainability in design and design in sustainability.**

We would be grateful if you could please respond to these three questions and return by Friday 18<sup>th</sup> May 2007 to: [deeds@beda.org](mailto:deeds@beda.org) . Thank you.

Please tell us what type of designer/s you are. (graphic, product, interiors, new media, etc): \_\_\_\_\_

**1/ Do what extent do you think design can have an impact on climate change issues?**

Please circle the number you wish to choose

1= not at all

10 = a considerable and direct effect

1    2    3    4    5    6    7    8    9    10

Additional comment: \_\_\_\_\_

**2/ To what extent, as a practising designer, do you feel you have the necessary tools and processes to support the implementation of sustainable design practices?**

Please circle the number you wish to choose

1= I/we have no tools and processes

10 = I/we have tried and tested tools and processes

1    2    3    4    5    6    7    8    9    10

Additional comment: \_\_\_\_\_

**3/ As a professional designer, what do you believe are the greatest barriers to practising sustainable design?**

Please rate the following on a score between 1 – 10 where 1 = not a barrier and 10 = a significant barrier.

**Lack of knowledge of designers**                    1    2    3    4    5    6    7    8    9    10



**APPENDIX 2** Countries from which responses were received to the BEDA sustainability questionnaire

Belgium  
Denmark  
Estonia  
Finland  
France  
Germany  
Italy  
Luxembourg  
Netherlands  
Poland  
Slovenia  
Spain  
Sweden  
UK

**APPENDIX 3** Breakdown of responses to BEDA questionnaire by (respondents' self-declared) design discipline

<b>Design Discipline</b>	<b>Respondents</b>	<b>Percentage</b>
Mixed (multi-discipline)	111	39.22%
Product and Industrial (including packaging & furniture)	80	28.27%
Graphic & Communication (including new media & typography)	67	23.68%
Interior	19	6.71
Architect	2	0.71%
Environment & Eco-design	2	0.71%
Fashion	1	0.35%
Design Buyer	1	0.35%
Totals	<b>283</b>	<b>100</b>