

Social Issues: Making them relevant and appropriate to undergraduate student designers

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Abstract

Sustainable design education is now considered a core issue for industrial/product design courses, however research has shown that the predominant focus tends to be on environmental issues, as social issues are much harder to tackle. Similarly, social issues are rarely considered in industrial practice. If student designers are to become responsible practitioners, they need to be made aware of social issues that they are in the position to effect. In order to do this it is critical that students are encouraged to consider issues which are relevant to their skill sets and within their sphere of influence. A review of the literature did not reveal a definitive list of social issues for designers to consider. In addition to this the majority of well-known tools used to support sustainable design teaching in UK/Europe, tend to have an ecodesign rather than a sustainable design focus. The few which do exist have their limitations.

The paper reports on the findings of an ADM-HEA¹ sponsored project. It presents the latest thinking with regards to social issues student designers should be considering. Drawing on a tools analysis and theory review, a set of Social Issues cards are developed and tested to determine their suitability for disseminating social issues to design students. The paper concludes that the tool offers a design oriented perspective of social issues (which has not been provided before) and is a valuable resource for raising awareness about social sustainability in undergraduate design students.

Key words

sustainable design; tools; social sustainability; social issues; product design; design education

Introduction

Sustainable design education has become increasingly prominent in recent years, with 2005 to 2014 being designated as the 'Decade of Education for Sustainable Development' (United Nations, 2002). In 2007 a worldwide study identified that over half of the 221 universities surveyed stated that sustainable design considerations were compulsory on their courses, whilst a further 37% stated it was optional (Ramirez, 2007). Despite this, in current sustainable design education (and practice) the predominant focus tends to be on

environmental issues (Conrad & Humphries-Smith, 2009; Cull, 2005; Ramirez, 2007). This practice is known as ecodesign, the activity of product design (which considers economic, functional, aesthetic and safety issues) with the additional consideration of environmental issues (Tischner & Charter, 2001). Sustainable design goes beyond the consideration of environmental issues and also considers the importance of social issues in design (Tischner & Charter, 2001; Elkington, 1997; Chapman & Gant, 2007). This paper presents the findings of an ADM-HEA funded project, entitled 'Visual tools for sustainable design education' which aimed to investigate the requirements and identify the attributes of tools to support the social element of sustainable design education. Specifically it reports on which social issues should be included in social sustainability tools for student industrial designers; discusses the attributes required of a tool to support the social element of sustainability; presents an emergent tool and reflects on its effectiveness when tested with design students.

Attitudes towards social issues in design

Although the focus of this paper is on design education, there is value in reflecting on and understanding the current attitude of professional industrial designers with respect to social sustainability. It has been seen that in general, social aspects are not integrated into the product development processes and only a few leading-edge companies have progressed beyond ecodesign (Bhamra & Lofthouse, 2007; Tischner & Charter, 2001). There has however been a growing interest in the use of design by foundations and NGOs to assist with social change, particularly in relation to the challenges of poorer countries (Acharya et al., 2008; Continuum & Inc., 2008). Recent examples include the Moneymaker Pump, an inexpensive and powerful small-acreage irrigation pump (KickStart, 2011) and LifeStraw, a portable water purifier in the form of a large straw (Vestergaard Frandsen, 2011). However, this level of design activity is tiny in relation to needs of the social sector. As Polak (2007) recognises, "ninety-five percent of the world's designers focus all of their efforts on developing products and services exclusively for the richest ten percent of the world's customers. Nothing less than a revolution in design is needed to reach the other ninety percent". The challenge is to move from these intermittent cases to a systemic approach that unleashes

¹ Art Design Media Subject Centre within the Higher Education Academy <http://www.adm.heacademy.ac.uk/>

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the power of design on some of the world's most intractable problems (Continuum & Inc., 2008). This will require identifying ways of engaging the passions of the design community (Acharya et al., 2008). One of the keys to this challenge is likely to lie with education.

There is clearly a need to encourage student designers to think about social sustainability, however there also appears to be a number of challenges to teaching social sustainability to design students, as this area is often neglected in undergraduate sustainable design education (Conrad & Humphries-Smith, 2009; Watson & Lofthouse, 2010). The fact that social sustainability takes a 'needs' focus means that it is considerably more difficult to implement than the product focus of ecodesign. Social issues also tend to sit across blurred boundaries with other disciplinary fields (e.g. inclusive design) which mean they can fall through the gap. In addition to this, early findings from this project identified that there is a lack of consensus and understanding regarding what sorts of social issues designers should be responsible for or can influence, which means that social sustainability is not being made relevant to design. There are many social issues affecting the world today (poverty, war, child labour, water and food shortages) however depending on the stance taken, many may be outside the remit of (student) designers. Pitt and Lubben (2009) report that "global issues such as population growth, pollution, human rights and fair labour practices" (p171) are seen to be distant issues over which designers have little control. Previous research has demonstrated how important it is that designers are asked to consider issues which are relevant to their skill sets and within their sphere of influence (Lofthouse, 2001). Failing to do this can leave designers feeling powerless, which can alienate them and make them feel that the topic is outside of their remit (Lofthouse, 2001). It is important to engage and empower designers when it comes to social issues as they "have enormous power to influence how we engage our world and how we envision our future" (Berman, 2009:1). If design students are to effectively consider the social element of sustainable design it is important to identify which areas they should focus on and raise their awareness accordingly. Developing understanding in this area is the key aim of the work reported upon in this paper.

The current situation regarding tools

Tools play an important role in the teaching of sustainable design. However, the majority of well-known tools used to support undergraduate teaching of Sustainable Design to designers in UK/Europe, such as; the Ecodesign web (Lofthouse & Bhamra, 2000), the Eco-indicator 99 (Pre

Consultants, 2000), The Promise Manual (Brezet & van Hemel, 1997) and the CES materials selector (University of Cambridge, 2008) tend to have an ecodesign rather than a sustainable design focus, which inevitably causes a bias in teaching towards environmental design. A small number of tools do focus on sustainable design to some degree; Design Abacus (Bhamra & Lofthouse, 2007), Flowmaker (Wemake, 2004) and 'Information/Inspiration' (Lofthouse, 2008). Although these currently play an important role in the delivery of sustainable design education to design students (Conrad & Humphries-Smith, 2009; Lofthouse, 2009) they have their limitations. For example, the abilities of the Design Abacus to function as a social sustainability tool is limited by the range and quality of social issues which students are able to identify. The lack of understanding regarding which social issues are relevant to student industrial designers can hamper staff in supporting this process. The limited content and open format of the Flowmaker cards, intended to encourage creativity, does not help students to consider unfamiliar issues. The 'Information/Inspiration' tool, which contains a wide range of ecodesign examples to inform and inspire students, only contains a few socially oriented examples.

Moving forward

In light of these findings, it was recognised that a knowledge gap exists with respect to supporting social sustainability. As such the project set out to identify appropriate social issues for student designers to consider and to identify an appropriate mechanism for disseminating these issues to student designers, to support their learning. The rest of this paper presents the methodology used and reports on the development of the 'Social Issues cards' and on the emergent findings which arose from empirical testing with student designers.

Methodology

Throughout the project a number of research activities were carried out (see Figure 1). These will be reported on consecutively – first focusing on the methodological approach taken to identify appropriate issues for student designers and then on the approach used to identify an appropriate dissemination mechanism.

Methodology for the identification of appropriate social issues

Background research to identify the breadth of social issues which might be considered in the design process consisted of a literature review and interviews with experts in sustainable design. Literature was sourced from reports, journals, books, tools, case studies, and websites which referred to ecodesign, sustainable design and design

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education. Qualitative data in the form of quotes and comments were extracted, recorded and referenced. The quotes were then coded and clustered in order to create a

manageable number of topics. 'Coding and clustering' is a common procedure for analysing qualitative data and was chosen as it allows the researcher to derive meaning from

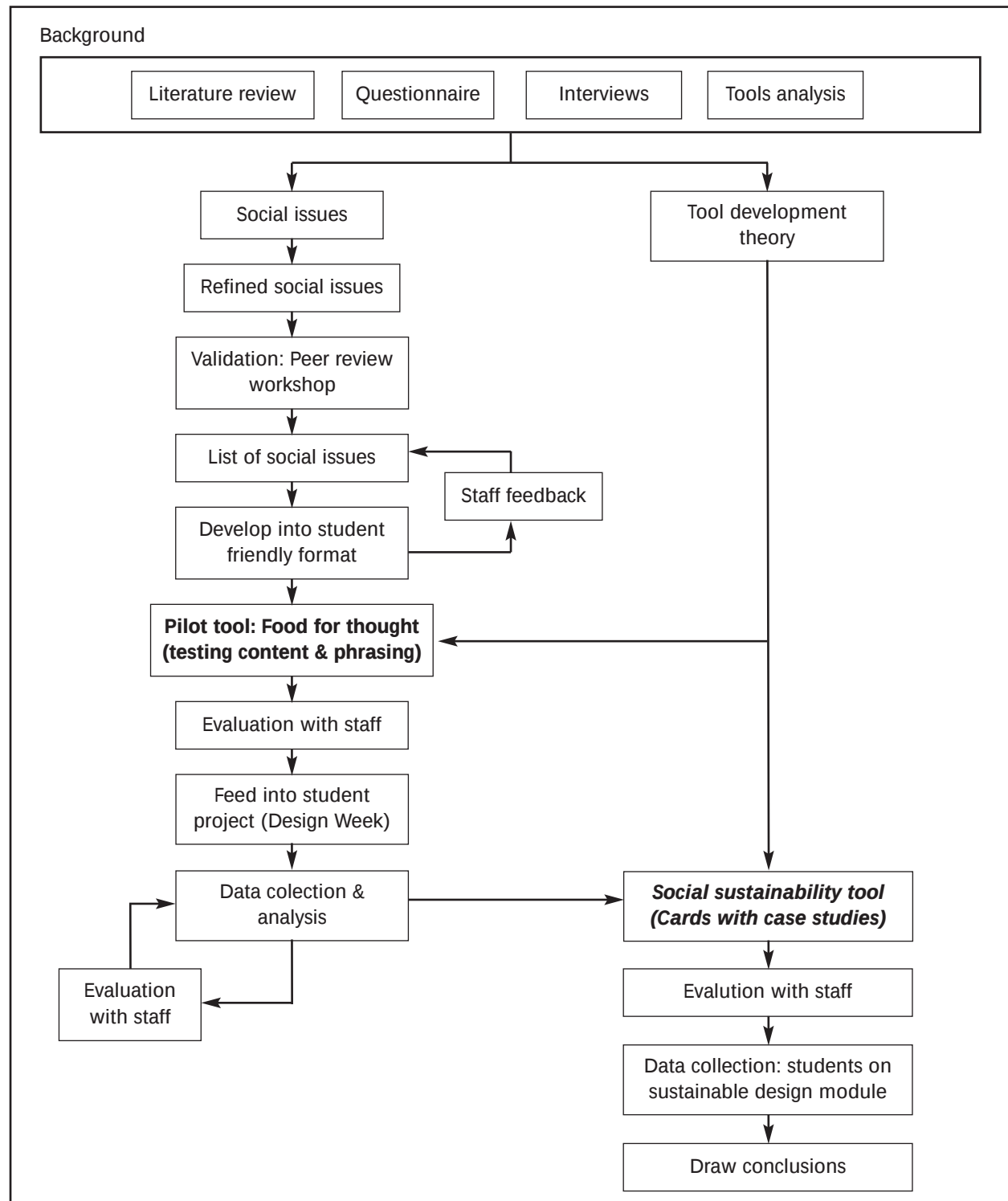


Figure 1. The research process followed during the project and the key activities undertaken

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words and build theory from data (Miles & Huberman, 1994; Robson, 1993; Strauss & Corbin, 1990). Though it was recognised that environmental and social issues are not mutually exclusive, this project focused primarily on socially oriented issues and issues with a social element to them. Consideration was given to whether or not each potential issue was something that designers could realistically influence. These findings were then validated by the data collected from semi-structured interviews with 11 experts in sustainable design education (see Table 1.), who were questioned as to which social issues they felt were appropriate for student designers to consider.

All the interviews were recorded, transcribed, coded using macro-codes derived from the literature review and clustered to identify common themes. The findings from the literature review and the interviews were then mapped over each other in order to try and identify a consensus. The data was analysed on the basis of 'recurrence' and 'importance'. 'Recurrence' was considered to be frequently recurring themes and 'importance' was where selection criteria was aided and informed by the researcher's subject knowledge, and the iterative nature of the inductive research process (Miles and Huberman, 1994). This meant that the researcher did not have to rely on more than one person recognising a phenomenon for it to be considered important, which is beneficial in a young research field. Internal validity was adhered to by the

process of pattern matching and explanation which took place during the data analysis (Yin, 1994). From the mapping exercise a number of issues were identified as being appropriate to include in the tool and a number of issues were excluded.

The data analysis was influenced by emergent findings from the background research as well as by the researcher's 12 years of expertise of working within the field of sustainable design and her training as an industrial designer. This meant that there was a level of subjectivity in the analysis with regards determining which issues may or may not be appropriate to designers. However the interviews and the Peer review workshop went a long way to negate any potential bias.

Peer Review workshop

The identified issues were tested in a Peer Review workshop which comprised 6 experts, 6 designers and 7 researchers associated with sustainable design. As all of the experts had either been recently interviewed for the project, or had written on the subject, they were put in the same group to avoid their knowledge having an overbearing influence on others and to create an opportunity to validate the findings that came from the interviews.

Job title	Expertise	Code
Senior Lecturer	Design, sustainable design, ethics, social sustainability	SL1
Professor	Sustainable design	P1
Senior Lecturer	Design	SL2
Senior Lecturer	Design	SL3
Professor	Industrial design, sustainable design	P2
Lecturer/Researcher	Design and sustainability	LR1
Lecturer/Researcher	Social sustainability, Happiness	LR2
Reader	Sustainable design	R1
Lecturer	Design, sustainable design, design behaviour	L1
Lecturer	Design, sustainable design	L2
Researcher	Design, practicing industrial designers	R2

Table 1. Role and expertise of interview candidates

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Hi I'm Jordan I'm a first year industrial design student and my next project is to design a kettle...



Not relevant...? Record here and if you want tell us why!

Figure 2. Peer review workshop template

After the introductions, the range of social issues which had been identified were presented (one on each card) and groups were asked to discuss whether or not they thought the issues were relevant to student designers. Once a decision had been reached they were asked to record it on the template (see Figure 2). Specifically they were asked to 'consider whether each issue would be relevant for the student 'Jordan' to consider in the design of domestic appliances...'. A key aim of University education is to equip students for professional practice, which is likely to involve designing consumer goods and services. As such the focus of this research was not on projects where students are asked to address a specific 'social' brief, but instead on the incorporation of socially responsible thinking into 'everyday' design projects.

At the end of the activity the participants were shown which issues were identified as relevant through the literature review and interviews. The templates were retained for analysis and the decisions made by each group were tabulated and compared to those which emerged from the background research. Drawing on these findings, the 'Food for Thought' checklist was created (see Figure 3). Its validity was tested with students during a one week design project delivered to 130 BA/BSc second year undergraduate design students at Loughborough

University. The brief was to redesign a domestic air freshener to create a 'beautiful and responsible solution'. The students were introduced to a range of ecodesign tools including the qualitative Abridged Design Abacus (Abacus) (Bhamra & Lofthouse, 2007).

Think about social issues, consider:

- How could your design improve health and well-being?
- How could your design encourage participation and belonging?
- How could your design encourage empowerment?
- How could your design promote personal abilities?
- How could your design enhance social interaction?
- How could your design enhance communication?
- How could your design enhance social engagement?
- How could your design enrich users' lives?
- How could your design increase quality of life for all?
- How could your design promote happiness?
- Is the product actually needed?
- How could your design encourage a sense of community?
- Other....

Figure 3. The 'Food for thought' checklist

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students might consider whilst answering the 'air freshener' brief. Once the initial findings had been compiled these were also discussed with staff on the module to validate assumptions.

Summary of the Abridged Design Abacus

In light of the emergent relationship between the 'Abacus' and the new checklist a fuller description of the tool is provided here. The Abacus helps designers to assess the sustainability performance of a product, highlight the areas where further research is needed and outline the targets for their redesign. It can be used to analyse the performance of an existing product, to compare a number of alternative design solutions and to make detailed comparison against other designs.

Using the 'Abacus' designers can evaluate a product against specific criteria, under a range of focal areas: lifecycle (manufacture, use, end of life, packaging); social (need, social enrichment); other (cost, quality, aesthetics). To carry out the activity, designers need one copy of the Abacus template for each focal area (see Figure 4). The area being focused on, e.g. Use, is written in the 'FOCAL AREA' box and then a number of issues are represented as both a good and bad characteristic (e.g. 'no energy use' vs. 'high energy use'). To assess the product, each issue is considered in turn and a judgement is made. This is a



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relative measure and accuracy is not needed. Once the score (+2, +1, 0, -1 or -2) is assigned for a particular issue the level of confidence in this assumption can be indicated on the top grid. This helps to highlight areas where further research is needed before a final score can be assigned. The assessment continues until all issues have been considered. The individual sheets are then joined together and a line drawn to connect all the scores and confidence levels. In the past it has been difficult to advise students as to the types of issues to consider under the 'social' focal area and any lists provided have tended to be copied 'parrot fashion', rather than being considered as a prompt.

Methodology for an appropriate dissemination mechanism

The literature review confirmed that there is little provision of support for industrial designers when it comes to sustainable design. However, theory to support the development of appropriate ecodesign tools for industrial designers (Lofthouse, 2001) provides some useful guidance. It has been seen that designers have 'their own way' of carrying out ecodesign (Sherwin, 2000) and that in the past [ecodesign] tools have failed because they do not take into account the culture of Industrial Design. It is highly likely that this is the same for sustainable design. An earlier study identified a number of key criteria which need to be combined in order for [an ecodesign] tool to be effective and appropriate for industrial designers (Lofthouse, 2006) (see Figure 5.).

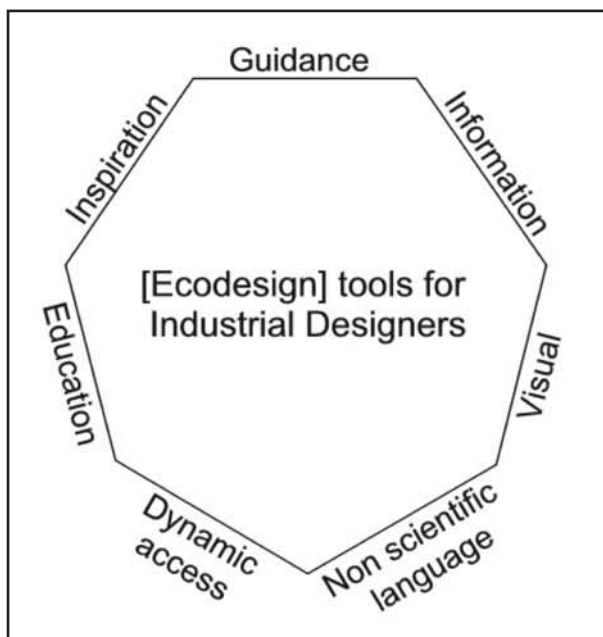


Figure 5. A holistic framework for Industrial Design focused ecodesign tools (Lofthouse, 2006)

This theory was used as a basis for the analysis of a number of existing tools (see Table 2) in order to identify any useful elements which could be taken forward to support the development of a useful social design tool for novice designers. The tools were selected on the basis of their design orientation and social issues focus.

This analysis resulted in the identification of a number of positive and negative attributes to integrate and avoid in the development of a social sustainability tool. These are presented and discussed later in the paper (see Table 2.).

As a result of the findings from the identification of social issues and the tools analysis, a set of social issues cards were developed (see Figure 7.). They were tested during a workshop session with 50 second year undergraduate design students who were carrying out an Abacus activity in response to a set of briefs on 'personal care'. All the students had previously been involved in the pilot study, so were familiar with the list of social issues. Each group was given a set of 30 cards to support their Abacus activity. Qualitative data was collected via student observations in the workshop, direct questioning and analysis of the submitted Abacuses. The qualitative data was analysed as per the previous section.

Findings: Social issues incorporated in the 'Food for Thought' checklist

As a result of the literature review, interviews and peer review workshop the 'Food for Thought' checklist presented in Figure 3 emerged. The key sources for each of the issues included, along with reasons for any notable omissions are presented below.

Social issues which were included

A number of the interviewees talked about the importance of designing for 'real needs' (SL1,R1,SL3) with some specifically referring to Maslow's (1954) and Max-Neef's (Max-Neef 1992) frameworks of needs. From this more specific issues were identified. The first five issues were identified through a combination of literatures sources and the interviews:

- encourage health and well-being (Elvins and Bassett, 2005, Pitt and Lubben, 2009) (SL1, SL3, P2, LR1);
- encourage participation and belonging (Ehrenfeld, 2004; Elvins & Bassett, 2005) (SL3);
- encourage empowerment and promote human competence (Orr, 1994; Elvins & Bassett, 2005) (SL1);
- enhance social interaction, communication and engagement (Elvins & Bassett, 2005; Thorpe 2007; Capewell et al., 2007);
- enriches users' lives or increases quality of life for all (Forum for the Future, 1999; Capewell et al., 2007).

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Tool	Description
Abridged Design Abacus (Bhamra and Lofthouse, 2007)	Outlined above
Play rethink (Rethink Games, 2007)	Play Rethink helps people think - or rethink - how to make everyday objects and services more socially and environmentally friendly. You spin the wheel, are given a card with a brief to rethink a particular everyday object.
Flowmaker (Wemake, 2004)	Flowmaker is an inspirational tool for designers, created by the WeMake design studio - www.wemake.co.uk . It takes the form of a pack of 54 cards, broken into 5 suits Instinct, Personality, Ageing, Play and Potential.
Information/Inspiration (Lofthouse, 2008)	Predominantly ecodesign focused web based tools for industrial designers to provide illustrative case studies and product related information. www.informationinspiration.org.uk
Financial + Social + Environmental + Personal = Sustainable An Introductory Guide to Sustainability for Designers	"The poster-size document folds out to reveal the contexts, agendas and issues for designers. It provides a visual framework of design issues within the big-picture of sustainability" (Elvins & Bassett, 2005).
Design/ Behaviour (Lilley & V Lofthouse, 2009)	'design-behaviour' is a resource specifically developed to raise awareness of design for sustainable behaviour and to support designers and engineers in applying DfSB strategies in their teaching, practice and research. www.design-behaviour.co.uk
DEMI (Fletcher & Dewberry, 2002)	The Design for the Environment Multimedia Implementation Project – demi – links design and sustainability information in a Web-based resource and was set up in response to a number of UK Government reports which highlighted the dearth of knowledge and activity about sustainability in higher education design courses across the country.

Table 2. Subjects for the tools analysis

All of these issues were also recognised as being important by the majority of the three Peer Review groups.

Another key issue to repetitively emerge was the idea of 'promoting well-being and happiness' (Escobar-Tello and Bhamra, 2009, Wemake, 2004, Elvins and Bassett, 2005) (SL3, LR2). These two issues were presented separately in recognition of Escobar-Tello & Bhamra's (2011) identifying that wellbeing is more related to quality of life, which can be delivered by the state (e.g. life health, education, contact with natural environments) and does not necessarily lead to happiness.

Another key issue identified through the literature was whether or not a product/service/system was actually

needed (Madge, 1997; Ehrenfeld, 2004; Wemake, 2004; Thorpe, 2007; Pitt & Lubben, 2009). Although not specifically identified by any of the interviewees, it was felt that this was more likely to be as a result of the questioning approach rather than the fact that it is not an important issue. This assumption was confirmed by the Peer review workshop, when all three groups agreed that it was an issue to be included.

Issues relating to community were varied. The opportunity to build a sense of belonging, meaning and cultural identity through a product from its associations with local geographic place was identified (P2, SL3). It was also reflected that consideration should be given to whether the design process will invest in community and enable

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and help people or society, or whether it would be likely to disadvantage or deprive communities (SL1). Manzini (1997) offers a different perspective and raises ideas around redesigning societies so that they become more sustainable. It could be argued that all of this is outside the remit of student designers, as they are big issues which are not one easily addressed by design. However the literature, the interviewees and the majority of the Peer review groups identified the issue of community as an important issue for consideration, and as such it was included.

Social issues which were not included

The reasons as to why a number of social issues were not included in the checklist are explained in this section.

Inclusive design

Inclusive design/universal design/design for the aged were identified as social issues relevant to designers in both the literature (Wemake, 2004; Elvins & Bassett, 2005; Fuad-Luke, 2009) and by the interviewees (LR1, R1, P1). Though these are clearly established issues it was decided that these would not be included in the tool at this stage because these are already well developed subjects with a long pedigree of study, and often taught to undergraduate designers through modules or even courses in their own right. In light of them being commonly addressed through design practice it was not felt that they needed to be specifically highlighted (P1) by a tool of this nature. It was felt that including them might actually prove to be detrimental to the consideration of other social issues as they would be a quick win for the students rather than encouraging them to think about less familiar issues.

Designing with a mind to cultural sensitivity

Designing with a mind to cultural sensitivity and cultural diversity was identified in the literature (Forum for the Future, 1999, Ehrenfeld, 2004, Thorpe, 2007, Pitt and Lubben, 2009), though not in the interviews. Issues of this nature raise questions such as;

1. 'is the product appropriate for the society and culture in which it will be used' (Capewell et al, 2007, Thorpe, 2007);
2. whether products 'encourage the maintenance of traditional knowledge and skills'; and 'maintain valuable social or cultural traditions' (Capewell, et al, 2007, Forum for the Future, 1999).

With respect to the first of these issues it can be argued that this is a key part of what design aims to do anyway (Whiteley, 1993) even if the cultural norms being designed for are not necessarily that palatable. Beyond

this, it is often quite hard to envisage where a product might be used, as it may be designed for use in the west where there is money to fund design and development, but find a greater following in developing countries (e.g. mobile phones). In light of this and the fact that the peer review participants felt these issues should not be included as they were not relevant to student designers, they were not included.

Global social issues

A number of broad social issues such as: the impact of manufacturing on the quality of life of others around the world; fair trade and basic human rights, e.g. fair pay, decent working conditions were identified as social issues by interviewees (SL1, P2, P1) and through the literature (Capewell et al., 2007, Elvins and Bassett, 2005). However it was recognised in the literature (Pitt and Lubben, 2009, Elvins and Bassett, 2005) and by the interviewees that these sorts of issues are too far removed to be relevant to design students/ designers.

Ethics

Ensuring that designs are ethical was recognised as an important practice in socially sustainable design and design teaching by a number of authors (Forum for the Future, 1999, Madge, 1997, Lofthouse and Lilley, 2009) and interviewees (P1, LR2, SL1), despite being a difficult subject to address. However ahead of testing the checklist, 'is the brief ethical?' was removed from the checklist in light of the fact that brief had been set internally and would not have been offered if had been considered to be unethical. It is not anticipated that this issue would be permanently removed from the checklist as it is a very relevant issue for students undertaking external projects. However, it was not deemed appropriate to test this issue in this instance due to the tight timescale of the project.

Local production

Issues such as localisation, localised production, and utilising local skills were raised through the literature (Forum for the Future, 1999, Rethink Games, 2007) and by interviewees (P1, P2, L2). It was recognised that these issues are often complex, for example, on the one hand, buying products from a developing country can support some of the world's poorest people, and on the other hand local economies also need supporting (Capewell et al, 2007) and less mileage is often perceived as being better for the environment. Beyond this complexity, there is also the issue that not everything can or should be produced locally (cars, domestic appliances, plastics etc.) and it is these types of consumer products that are being considered here, not craft based products such as furniture and jewellery. Finally it was recognised that the

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decision as to where things are produced is generally outside of the remit of designers. In light of this it was felt by the interviewees and the peer review groups that the relevance of these issues to students was questionable and as such this issue was not included.

Findings from testing of contents of the 'Food for Thought' with student designers

The testing of the checklist with the design students produced a number of useful findings which helped further the development of the tool.

Three of the 15 issues in the checklist were considered by a reasonably high proportion of the students.

- How could your design enhance social interaction? (12/18)
- Is the product actually needed? (11/18)
- How could your design promote happiness? (9/18)

These issues were recognised as being particularly relevant to the brief, or issues which the students could especially relate to. They were not, however, issues which any of the staff had seen included in previous years' submissions. Additionally, a few students considered:

- How could your design enrich users' lives? (4/18)
- How could your design increase quality of life for all? (2/18)

Again these were not issues which had been recognised through 'Abacus' submissions in the past. This suggests that the checklist did help to raise their awareness with respect to social issues and encouraged students to consider them within their practice.

The checklist also enabled the students to identify social issues which were relevant to their brief. For example 'How could your design improve health and wellbeing?' was considered by 6/18, with issues involving 'safety' raising the tally to 11/18. Given the nature of the brief, health and safety issues would have been likely to have been included with or without the checklist.

Some issues were not considered at all by the students:

- How could your design encourage a sense of community?
- How could your design enhance communication?

This finding was seen as a positive outcome, as part of the intention of the tool was that students should feel they could pick and mix the issues they wished to consider and that it will not always be appropriate to consider all social issues in each case. Tied in with this, it was positive to note that using the checklist did not stop the students

from coming up with their own social issues, for example "hygienic – unhygienic".

Two additional relevant issues; 'demonstrating the values of the user?' and 'creating an emotional bond with the user?' emerged through the testing phase. On reflection these seem to have arisen in response to previous lectures on emotional durability. It was felt that these were design oriented social issues, within the sphere of influence of designers and as such were included in the final iteration of the checklist (see Figure 6). It has been noted that these issues were not identified by the data collection phase and clearly there might be more issues like this. This could have been due to the scope of the literature review but may also be due to the literature being dispersed over a broad, multidisciplinary range of subjects.

A number of refinements to the wording and how issues were grouped together also emerged during the analysis (see Figure 6).

Findings: Tool development

Analysis identified that design oriented tools in the ecodesign/sustainable design field can be differentiated in

Think about social issues, consider:

- How could your design improve health and well-being?
- How could your design encourage participation and belonging?
- How could your design encourage empowerment and promote human competence?
- How could your design enhance social interaction or engagement?
- How could your design enhance communication?
- How could your design enrich users' lives and increase quality of life?
- How could your design promote happiness?
- How could you design demonstrate the values of the user?
- How could your design create an emotional bond with the user?
- Is the product actually needed?
- How could your design encourage a sense of community?
- How could your design maintain local/ cultural traditions?
- Other...

Figure 6. Final iteration of the 'Food for thought' checklist

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terms of their focus (introductory, early stage life cycle, late stage life cycle), their format (lifecycle focus, focal areas, hierarchical), their purpose (strategic, educational, inspirational, combinational etc.), the time they take to complete, and their nature (qualitative or quantitative).

The fact that considering social sustainability in design is not widely practiced (Conrad and Humphries-Smith, 2009) suggested that an introductory tool was needed. The initial intention of the project was to develop a tool based upon the Ecodesign web an introductory ecodesign tool with a proven track record (Lofthouse, 2009). However early findings indicated that the lifecycle format of Ecodesign web was not appropriate for the consideration of social issues. Whereas, when students use lifecycle tools to consider ecodesign issues, they should be encouraged to reflect on improvement opportunities at each stage of the life cycle, this does not

work for social issues. This type of lifecycle thinking encourages students to think about issues which are too far outside of their remit (e.g. the social implications of mining for Coltan in the Democratic Republic of Congo) and omits all of the relevant social issues identified in the checklist (Figure 6). It was also recognised that social issues differ from ecodesign issues with respect to the fact that not all issues are going to be relevant to a given brief. As such students need to feel that they can pick and choose the relevant issues to focus on. Both of these findings indicated that a 'focal areas' approach, would be more appropriate for the consideration of social issues. This approach, as favoured by Philips (Koninklijke Philips Electronics N.V., 2013), involves identifying relevant areas to focus on – in this case, the issues identified in the 'Food for thought' checklist.

Characteristics to consider including	Characteristics to avoid
Offer guidance	Need for a reasonable level of prior knowledge
Inspirational case studies	A lack of guidance means students often focus on inappropriate social issues
Educate them/raise awareness	Not clear how to use it
Offer dynamic access	Time intensive for teaching
Be written in a non-scientific language	Not easy to apply to real life projects
Visually interesting	Not holistic enough (only focuses on one issue at a time)
Flexible to allow students to consider a wide array of issues	Lack of guidance
Encourage discussion	Unfeasible outputs
Encourage students to think about what issues are appropriate, rather than simply copying them down	Lifecycle focus
Interactive, support learning by doing	
Game element makes it interesting	
Visual reminder – wall chart	
Allows novice designers to compare different characteristics of a product in a better than worse than way	
Can be picked up with a bare minimum of expertise	

Table 3. Potential positive and negative attributes to integrate and avoid in the development of a social sustainability tool

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With respect to the purpose of the tool, the theory on ecodesign tools for industrial designers suggests combining information, inspiration, education and guidance (Lofthouse, 2006), all of which appear to be appropriate aspirations for a social issues tool. As the intention was for this to be an introductory tool it was felt that it would be appropriate to develop a tool which could be used over a fairly short time scale and that was qualitative in nature. All of these considerations along with the findings from the 'tools analysis', which identified a

number of interesting characteristics which could be drawn upon (see Table 3), supported the development of the tool.

Development of the Social Issues cards

The outcome of this background research was to present the social sustainability tool as a set of cards (combining an image and illustrative case study), based on the questions identified in the 'Food for Thought' checklist.

It was felt that cards could be visually interesting, quick to use, offer dynamic access in a workshop environment, as well as offering inspiration and information through the case studies provided, which would help to demystify the process and demonstrate how each of the issues can be considered by designers (Lofthouse, 2001). There is also a precedent for using cards of this nature with design teams (IDEO, 1999; Luebke, 2009).

The process of developing the tool was an iterative one. Each question in Table 1 was rephrased so as to be more appropriate for students responding to a specific design brief e.g. 'Does it encourage empowerment and promote human competence?' It quickly became clear that one example for each issue was not enough because of the diversity of the subjects that could be covered, therefore a range of examples for each topic were generated. A literature review and web search were undertaken to identify appropriate case studies from developing and developed countries to illustrate the identified issues. Often social issues are only associated with the developing world, but this approach provided the opportunity to consider a wider range of contexts. For the 12 social issues which had been identified, 30 cards were developed. On average 3 or 4 examples per topic were identified.



Figure 7. Examples of two contrasting social issues cards

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A reasonable split of examples for developing and developed countries was achieved. Two examples are shown in Figure 7.

Findings: Testing the Social Issues cards

As outlined in the methodology, the cards were tested in a workshop by students engaged in a sustainable design project. During the early stages of the workshop, when they were focusing on identifying focal areas for their Abacuses, the groups handled the cards in different ways. Three groups laid them out on the table (word side up), see Figure 8 and one group took pictures of the words on the cards (not the pictures), so that they could write around the subjects in their log books.

Through observing the students it could be seen that at various points in the workshop, a number of the students picked up cards that they thought looked interesting and read them. Some chatted with other group members about the case studies (e.g. Playpump). A Group who were looking at the Cardboard furniture case study (WeMake, 2011) followed up their interest in the idea by looking on YouTube for other cardboard furniture ideas via an Ipad. As the workshop progressed the cards were mainly used for inspiration by all of the groups.

Use of the cards was sporadic indicating that the format allowed the students to use them as and when they wanted to, thus fulfilling the aim of 'dynamic access'. Use was also seemingly random. None of the groups worked through the cards in any formal way, they simply picked up cards that they were interested in (for whatever reason)³.

Group C pulled up an electronic copy of the 'Food for thought checklist' from their Virtual Learning Environment to use alongside the cards. This suggested that providing the students with the checklist as well as the cards would be a sensible way forward (even if they were not both used by all students). When questioned, they reflected that the cards and the checklist together proved to be a useful combination. When directly questioned as to whether the cards were more or less useful than the checklist, an interesting mixed response was received. Group C said that it was 'nice to have them to spread out' and 'nice to have the examples' but 'good to have the list as well'. Students within other groups commented that the examples were useful. The majority of the students in the workshop appeared to have a neutral or positive response to the cards, with a number of the students questioned responding very enthusiastically, stating that the examples were inspiring.

³ N.B. Not always because they liked the example



Figure 8. Students testing the Social Issues cards

"Yeah they were really useful, because they helped you to see how it could be done"

Only three students out of 30 had negative responses. One student was overheard saying 'what's this got to do with anything?' as he read out the case study to the group and they started to discuss it. When questioned on this later it emerged that the case study in question was Lime based conservation training (see Figure 9). They did not feel that this had anything to do with product design and which led to a very negative response. In hindsight their observation about the relevance of the case study to design was fair and this was not the best example that could have been used. This finding further supports theory with regards to the importance of making sure that examples are relevant to product design (Lofthouse, 2001). Clearly the relevance of the examples is as important as the suitability of the issues they are being asked to consider.

Analysis of the Design Abacuses created

Of the six groups who completed a Design abacus for their project, five of them directly considered social sustainability issues.

Following analysis, it was possible to determine that as with the checklist, the cards:

- enabled the students to pick and choose the important issues.

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Figure 9. Case study example which was not well received by the student designers

- allowed them to identify social issues which were relevant to their brief e.g. enriches users lives, shows values of the user, promotes empowerment.
- allowed them to recognise that it is not always appropriate to consider all social issues.
- did not stop the students from coming up with things their own social issues, which is a good outcome. For example, for the one project raised issues such as desirability, collectability, personalisation.

The two highest ranking criteria for this particular set of projects were 'promoting happiness' and 'encouraging social interaction/ participation/ sense of community'. It is interesting to note that these issues were also highly utilised in the pilot study.

Conclusions

Early findings identified that the lack of consensus regarding what sorts of social issues designers should concentrate on has meant that social sustainability has not, in the past, been made relevant to design. This project has opened up the debate as to what social issues are appropriate to student designers and through robust research has led to a much clearer understanding of the types of social issues which might be relevant for them to consider for a broad range of projects (see Figure 6). This new knowledge will have benefits for teaching the subject in general, as it will enable lecturers to better focus their teaching material on issues which designers can influence.

In addition to this, two new tools for supporting the consideration of social issues have emerged. Though the intention was that the 'Social Issues' cards be the main output of this project, the findings suggest that there are benefits to providing both tools in combination. In general both the students and the staff found the 'Food for thought' checklist and the 'Social Issues' cards to be valuable resources for raising awareness about social sustainability in undergraduate design students. They offer a design oriented perspective of social issues (which has not been provided before) and have been seen to raise student awareness of social sustainability. They have been seen to be complementary resources for supporting the 'Abacus' – which is well placed to allow student to

consider a wide range of sustainable design issues. It is anticipated that both tools could also be used in conjunction with other tools or as stand-alone resources and early findings back up this supposition.

The testing of the 'Social Issues cards' with the design students produced a number of useful findings. It was seen that the use of the cards encouraged students to integrate new (relevant) social issues into the Abacus. The appearance of a number of issues which had not been identified by students in the past, suggested that the cards did help to raise their awareness with respect to social issues. They also enabled the students to identify social issues which were relevant to their brief.

Though they were using the cards, the students seemed to recognise that it was not always appropriate to consider all the social issues available. All the Abacuses from the students demonstrated that they took a pick and mix approach to the social issues available. It was positive to note that using the cards did not stop the students from identifying their own social issues. Additionally, by not providing the actual words to put in to the Abacus, the students had to spend time thinking about the meaning, rather than copying them verbatim.

In general the students liked the cards. The visual nature of the cards in terms of the examples and their tactile physical presence was well received. A number of

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students specifically stated that they found them to be inspirational, though it was recognised that examples MUST be relevant to product design to be valuable and therefore need to be carefully selected. However, one of the benefits of the flexible nature of the tool is that it can be quickly amended and new issues and case studies can be added as they emerge.

In the introduction it was stated that nothing short of a revolution would change the status quo with respect to design for sustainability (Polak, 2007). This paper is not claiming that these tools will spark a revolution but it is hoped that raising awareness and enabling action, amongst whole cohorts of students will lead to a generation of more enlightened graduates moving into mainstream design practice. After all a 0.5% improvement in a successful large scale global company will have a massive impact as a result of the multiples of millions of units which are being sold (Chapman & Gant, 2007).

Next steps

The cards will continue through an on-going cycle of testing and refinement. Version 1.1 is in the process of being published for sale through the University website.

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References

- Acharya, T. et al., 2008. *Design for Social Impact: A How-To Guide*, The Rockefeller Foundation, New York.
- Berman, D.B., 2009. *Do Good: How Designers Can Change the World*, AIGA – New Riders, Berkeley.
- Bhamra, T. & Lofthouse, Vicky, 2007. *Design for Sustainability: A Practical Approach*, Gower, Aldershot.
- Brezet, H. & van Hemel, C., 1997. *Ecodesign: a promising approach to sustainable production and consumption*, UNEP, Paris.
- Capewell, I., Zanker, N.P., Norman, E.W., Trimmingham, R.L., Simmons, P.C., Macgarry, A., Gwillim, J., Hellier, B., Woods, L. and Pitt, J., 2007. *The Sustainability Handbook for D&T Teachers*, Practical Action, Bourton on Dunsmore.
- Chapman, J. & Gant, N., 2007. *Designers, Visionaries and Other Stories: A Collection of Sustainable Design Essays*, Earthscan, London. Available at: <http://www.loc.gov/catdir/toc/ecip0713/2007009558.html>
- Conrad, F. & Humphries-Smith, T., 2009. The Development of an on-line resource learning and teaching resource for the socio-centric aspects of sustainable design. In *International conference on engineering and product design education*. University of Brighton, 1-6.
- Continuum & Inc., D.C., 2008. *Design for Social Impact – Workshop*, The Rockefeller Foundation. Available at: <http://www.dcontinuum.com/content/portfolio.php?id=300>.
- Cull A., K., 2005. *The Education of Undergraduate Product Designers in the Principles and Practice of Sustainable Design*. Robert Gordon University, Aberdeen.
- Ehrenfeld, J., 2004. Searching for sustainability: no quick fix. *Reflections*, 5,8, 1-13.
- Elkington, J., 1997. *Cannibals with Forks: The Triple Bottom Line of 21st Century Business*, Capstone Publishing Ltd, Oxford.
- Elvins, L. & Bassett, R., 2005. *Financial + Social + Environmental + Personal = Sustainable An Introductory Guide to Sustainability for Designers*, London. Available at: <http://www.a420.com>
- Escobar Tello, M.C. & Bhamra, T., 2011. *Explorations on the Relationship Between Happiness & Sustainability*. Loughborough University, Loughborough.
- Fletcher, K. & Dewberry, E., 2002. Demi: a case study in design for sustainability. *International Journal of Sustainability in Higher Education*, 3, 1, 38-47.
- Forum for the Future, 1999. Sustainable Development Education: Design Specification. *Sustainable Development Education Panel Position Paper, part of the HE21 (Higher Education for the 21st Century) project*.
- Fuad-Luke, A., 2009. *Design Activism: Beautiful Strangeness for a Sustainable World*, Earthscan, London.
- IDEO, 1999. Human Centered Design Toolkit. Available at: <http://www.ideo.com/work/item/ide-and-gates-foundation-human-centered-design-toolkit/>
- KickStart, 2011. Super MoneyMaker. Available at: <http://www.kickstart.org/products/super-moneymaker/>.
- Koninklijke Philips Electronics N.V., 2013. Green Focal areas. Available at: <http://www.philips.com/about/sustainability/ourgreenproducts/greenfocalareas/index.page>
- Lilley, D. & Lofthouse, V, 2009. Sustainable design education – considering design for behavioural change. *Engineering Education: Journal of the Higher Education Academy Engineering Subject Centre*, 4,1, 29-41.
- Lofthouse, Vicky & Bhamra, T., 2000. Ecodesign web.
- Lofthouse, V.A., 2006. Ecodesign tools for Designers:

Social Issues: Making them relevant and appropriate to undergraduate student designers

- Defining the Requirements. *Journal of Cleaner Production*, 14, 15-16, 1386-1395.
- Lofthouse, V.A., 2009. Ecodesign tools in design education. In *International conference on engineering and product design education*. University of Brighton, 384-389.
- Lofthouse, V.A., 2001. *Facilitating Ecodesign in an Industrial Design Context: An Exploratory Study*. Cranfield University, Cranfield.
- Lofthouse, V.A., 2008. Information/Inspiration. Available at: www.informationinspiration.org.uk
- Luebke, C., 2009. *drivers of change*, Prestel, London.
- Madge, P., 1997. Ecological Design: A New Critique. *Design Issues*, 13, 2, 44-54.
- Manzini, E., 1997. Leapfrog – designing sustainability. *Domus*, 789, 1, 43-51
- Maslow, A., 1954. *Motivation and personality*, Harper, New York.
- Max-Neef, M.A., 1992. *From the outside looking in: Experiences in "barefoot economics,"* Zed Books, London.
- Miles, M.B. & Huberman, A.M., 1994. *An Expanded Sourcebook - Qualitative Data Analysis* 2nd ed., Sage Publications, London.
- Orr, D., 1994. *Earth in mind: on education, environment, and the human prospect*, Island Press.
- Pitt, J. & Lubben, F., 2009. The social agenda of education for sustainable development within design & technology: the case of the Sustainable Design Awards. *International Journal of Technology and Design Education*, 19, 2, 167-186.
- Polak, P., 2007. Design for the Other Ninety Percent. In C. R. Kim, ed. *Design for the Other 90%*. New York: Cooper-Hewitt, pp. 19-25. Available at: <http://other90.cooperhewitt.org/?gclid=CLuNxtrStqlCFRI-lAodtBbV5g>.
- Pre Consultants, 2000. *Eco-indicator 99 Manual for Designers*, The Hague.
- Ramirez, M., 2007. Sustainability integration in industrial design education: a worldwide survey. *Connected 2007 International Conference on Design Education*.
- Rethink Games, 2007. Play rethink, Board Game. (Accessed 16th July 2009). Available at: <http://www.playrethink.com/>
- Robson, C., 1993. *Real World Research – A resource for Social Scientists and Practitioner-Researchers*, Blackwell Publishers Ltd., Oxford.
- Sherwin, C., 2000. *Innovative Ecodesign – An Exploratory and Descriptive Study of Industrial Design Practice*. Cranfield University, Cranfield.
- Strauss, A. & Corbin, J., 1990. *Basics of Qualitative Research: Grounded Theory, Procedures and Techniques*, Sage, London.
- Thorpe, A., 2007. *The Designer's Atlas of Sustainability: Charting the Conceptual Landscape through Economy, Ecology and Culture*, Island Press, Washington.
- Tischner, U. & Charter, M., 2001. Sustainable Product Design. In M. Charter & U. Tischner, eds. *Sustainable Solutions – Developing Products and Services for the Future*. Greenleaf Publishing Ltd., Sheffield. 118-138.
- United Nations, 2002. *Decade of Education for Sustainable Development (2005-2014)*, United Nations Educational Scientific and Cultural Organisation.
- University of Cambridge, 2008. CES EduPack.
- Vestergaard Frandsen, 2011. The LifeStraw Concept. Available at: <http://www.vestergaard-frandsen.com/lifestraw>
- Watson, M. & Lofthouse, Vicky, 2010. A Review of Sustainability within Product and Industrial Design Courses in British Universities. *International conference on engineering and product design education*.
- Wemake, 2004. Flowmaker, (13th July 2009). Available at: <http://www.wemake.co.uk>
- Whiteley, N., 1993. *Design For Society*, Reaktion, London.
- Yin, R.K., 1994. *Case Study Research – Design and Methods* 2nd ed., Sage Publications, Inc., Thousand Oaks, London, New Delhi.
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