

# ‘Everyday Interventions’: Engaging Students with Sustainability and Sustainable Design, a Case Study

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## ABSTRACT

It has become increasingly evident that the impacts of human development and production/consumption over the last half of the twentieth century and into the twenty-first century are unsustainable in the long term. The response to this is an increased focus on identifying opportunities to support and enhance sustainability. ‘The transition towards sustainability, in its everyday dimension, can be described as follows: in a short period billions of people must redefine their life projects’ (Manzini & Jegou, 2006). This transition not only presents a huge challenge for product designers but also provides opportunity for designers to begin to reframe their practices and processes. Design education for sustainability can help usher a promising future by transforming the designers of tomorrow (Ramirez, 2006). It is therefore imperative that the teaching of sustainable design thinking is embedded deeply into the curriculum of design programmes. In response to the need for a focus on sustainability in higher education, this paper presents a critical review of a second year product design student project at AUT University, School of Art and Design entitled ‘Everyday Interventions.’ This paper will present key aspects of the project including the rationale, approach and processes, as well as student engagement and design outcomes.

## INTRODUCTION

One of the most commonly used definitions of sustainability is based on the concept of sustainable development and was developed by Gro Harlem Brundtland, Chair of World Commission on Environment and Development, who states “Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED., 1987, p. 47). It is clear that humanity is using the planet’s resources faster than they can be renewed. ‘Climate change, ecological degradation and pervasive poverty in developed and developing nations are some of the most troublesome outcomes of the industrial era’ (Doppelt, 2003, p. 15). The ecological footprint of people

now exceeds the world’s ability to regenerate it by about 25% (Leape, 2006). Over the next few decades humanity will be increasing faced with having to contend with the negative environmental and social impacts of human development.

Sustainable design has emerged as a response to concerns regarding the negative environmental and social impacts of human development. Design for sustainability can be defined as a strategic design activity which aims to conceive and develop sustainable products services and solutions (Manzini, 2006). The notion of a more ecologically and socially responsible approach to design is not new. In the early 1970s Papanek (1971) challenged the existing attitudes and practices of designers and outlined an approach to design that emphasises social and ecological responsibility and he argued that the aims and approaches to design must be more sensitive to social and ecological considerations and the genuine needs of people. In 2001 industrial designers from around the world declared that ‘industrial design will no longer regard the environment as a separate entity’ and that ‘we, as global designers shall pursue the path of sustainable development by coordinating the different aspects influencing its attainment, such as politics, economy, culture, technology and environment’ (ICSID, 2001).

## I. SUSTAINABILITY AND SUSTAINABLE DESIGN IN HIGHER EDUCATION

‘Higher education institutions bear a profound, moral responsibility to increase the awareness, knowledge, skills, and values needed to create a just and sustainable future’ (Cortese, 2003). Cortese (2003) also states that the change in mind-set necessary to achieve this vision is a sustained, long-term effort to transform education at all levels. A response to this predicament is to establish a new educational agenda with entirely new ways of thinking and new intellectual priorities to rescue the environment and the human prospect, such that ‘those now being educated will have to do what we, the present generation, have been unable or unwilling to do’ (Ramirez, 2006). In addition Wals and Jickling (2002) state that sustainability provides colleges and universities an opportunity to confront their core values, their practices and the way they program for student learning.

While design educators have responded to sustainable imperatives in various ways, it appears that approaches are mixed and appear often to be ad hoc. According to Ramirez (2006), a survey of Australian industrial design programmes demonstrated that aspects of environmentally sensitive design are currently being incorporated in most Australian industrial design degree programs, albeit to a minor extent. 'Only 38% of respondents indicated that their programs had a dedicated "green design" studio course, where students actually generated design solutions within the context of traditional industrial design education' (Ramirez, 2006).

## II. PRODUCT DESIGN AT AUT UNIVERSITY

The three-year undergraduate product design programme at AUT University was developed in 2007 and launched with the first intake of students in 2008. In 2010 the programme will have 75 students across the three years as well as five studying at postgraduate level. The student profile indicates that the undergraduate students in the programme have predominantly transitioned directly from secondary school with a small percentage of students in the 20 to 30 year age bracket.

While the development of a new academic programme provides many organisational and operational challenges, it also presents a unique opportunity to develop new approaches to teaching and learning and without the constraints of institutional history and tradition. An innovative pedagogical approach to product design is currently being developed in the product design programme at AUT that expands the definition of a 'product' to become a range of outcomes i.e. 'the product of' a creative design process. The emphasis on learning becomes 'design thinking' as an outcome rather than necessarily on the tangible, physical 3D product outcomes. Further to this, and as a response to emerging world sustainability issues, sustainable design is currently being deeply embedded in the curriculum, pedagogy and focus for the entire programme.

The project, along with a number of other initiatives, was seen by the department as a catalyst to begin building knowledge and capability in the area of sustainable design and to start to gauge student, interest awareness and understanding of sustainability issues.

## III. 'EVERYDAY INTERVENTIONS' PROJECT

'Everyday Interventions' was a seven week studio project undertaken by 23 second year students at the beginning of semester two. The project was lead by a team of two lecturers, one academic and one guest lecturer from industry. The key aim of the project was to introduce and begin to engage students with some of the fundamental concepts of sustainability and sustainable design, leading to practical, tangible outcomes through a creative design process. It was also hoped that the project would also assist students to

become engaged with broader issues around the role of design in creating a better future. For the purposes of the project the focus was limited to environmental dimension rather than social dimension of sustainability.

Given the complex and often 'negative impact', focus of environmental sustainability i.e., impending climate crisis, a more optimistic approach to the project was developed to inspire and motivate students. As Ramirez (2006) states, environmental (sustainability) education should thus be more optimistic and empowering. Rather than focusing on just trying to reduce the negative environmental impacts of products through design (eco efficiency), the project focused on a human-centred approach to sustainable design with potentially more positive, practical human behavioural change outcomes. Further to this as Orr (1992) states 'the study of environmental problems is an exercise in despair unless it is regarded as only a preface to the study, design, and implementation of solutions'. Students were encouraged to see themselves as possible agents of change.

'Everyday Interventions' was selected to deliberately remove the word 'product' from the title reflecting the broader approach to product design at AUT, and to encourage students to research and explore more laterally and to go beyond products such as service and system based approaches and solutions. The project was divided into three key phases: 1. Research, 2. Exploration, 3. Design.

## IV. SUSTAINABLE DESIGN FRAMEWORKS

A number of key lectures and discussions were used to engage students in discourse around the broader issues of sustainability and to launch and underpin the project. Students were first asked to consider how they personally envisioned the 'future' and this was used to unpack a number of key world environmental and social issues. From this the history of environmental and social sustainability was discussed leading to philosophical and 'values' based perspectives. Much of this discussion focused on the notion that while design has contributed to 'unsustainable' development through production/consumption models, design can potentially play a more positive role in starting to move towards a more sustainable future.

Initial feedback that emerged through discussions at the beginning of the introduction suggested that while the majority of students seemed to have some understanding of future issues i.e. climate change, social issues, it was a clear that many students did not appear to grasp the breadth, depth, scale and complexity of the issues, and the implications that these issues would be likely to have on them personally and in their lifetimes.

From this point a number of sustainable design frameworks and approaches were presented and then used to explore and 'define' sustainability and approaches to sustainable design,

as well as to drive the research and creative design process. The frameworks were seen as a ‘way in’ and start point to the project, and something that students could draw upon during the process. Students were also encouraged to also to begin their own investigations and background research.

The following summarises examples some of the key frameworks that were presented and discussed.

### 1. Sustainable Design

A frequently cited framework by Tischner (2000) provides a simple but useful overview of the relationship between sustainable development and sustainable design. This model provides a more holistic view of sustainable design and includes production and consumption as key drivers. This model presents sustainable design as something greater, or more encompassing than eco-design.

### 2. Levels of Sustainable Design

Stevens (1999) describes a framework of sustainable design, which incorporates four levels of sophistication.

These levels provide not only a good way assessing and categorising current levels and approaches to sustainable design, they are also useful to identify further aspirations and goals for the students within the design and creative process.

Level 1	Incremental or small and progressive improvements to existing products.
Level 2	Radical redesign of existing products based on existing concepts.
Level 3a	New product or service concepts to satisfy the same functional need.
Level 3b	Green system design or design for a more sustainable society.

Fig. 1. Stevens, 1999.

### 3. Design for a Sustainable Future

Ezio Manzini states that ‘design for sustainability is a strategic design activity finalised to conceive and develop sustainable solutions (Manzini, 2006). He goes on to discuss the notion that the transition towards sustainability calls for a radical change i.e. a systematic discontinuity. The transition towards sustainability must occur over the next few decades and is a learning process in which humans have to learn to live better with the use of a lot less resources. Corresponding with Stevens (1999) level 3B, Manzini further discusses this framework in which design for sustainability can transform existing systems and generate new ones.

### 4. Cradle to Cradle™

McDonough and Braungart (2002) present an internationally recognised philosophy and model of sustainable design titled ‘Cradle to Cradle™’. The model focuses on the transformation of industry through ecologically intelligent design rather than the current model which they

call ‘eco-efficient’ design. The key focus is on sustainability as a driver for more radical approaches to products and services through what they call the ‘Triple Top Line’. This model is particularly useful in that it presents a positive and optimistic role for designer and design thinking.

### 5. Sustainable Design and Behavior Change

Bharma and Lofthouse (2007) in the book Design for Sustainability, state that designers are in a very good position to reduce use impacts by purposefully shaping human behaviour towards more sustainable practices. In addition Lilley (2009) proposes a model that encourages users to behave in ways prescribed by the designer through the embedded affordances and constraints. The focus on design as a tool for human behaviour change is a key tenant and driver of the project. For the purposes of the project an environmentally unsustainable behaviour is defined as an activity, action, attitude and pattern of use that results in a clearly defined, negative impact on the environment.

In addition a number of case studies of real projects were introduced and critiques to support and supplement the sustainable design frameworks.

## V. THE DESIGN PROCESS

Given the relatively short period of the project and complex nature of the topic the students were provided with a carefully structured design process and with a set of design tools and techniques.

### 1. Research.

Given the human-centered approach to the project, a participant observation study (Bharma and Lofthouse, 2007) was used to drive the research phase of the design process. The goal was to identify ‘actual’ user practices, habits and behaviors in relation to clearly defined negative impacts on the environment. Students were asked to select an adult who they knew very well and who with agreement they were able to ‘shadow’ for an extended period of time (no less than two hours) and over a number of days while they went about normal activities. For confidentiality and ethical reasons students were also asked to not disclose any aspects of the identity of the person to other members of the class or to lecturers.

The process of observation was discussed in studio sessions with most students agreeing that after a period of time the participants forgot that they were being observed and therefore were generally not moderated by the observation process. Overall the feedback from students indicated that they enjoyed the observation process and were able to look deeply at activities and behaviours with ‘fresh’ eyes.

From this process, and using definitions developed, three key clearly ‘unsustainable’ practices, habits and behaviors

## VI. STUDENT DESIGN OUTCOMES

were identified, documented and presented to small groups for evaluation. A matrix of criteria was developed to assess and evaluate each of these for ‘design potential’. From this students were able to select a particular design opportunity to explore. At this point students were also asked to further reflect of the frameworks that they were presented with.

### 2. Exploration.

Students were then encouraged to further research and unpack the specific selected activity/behavior as a ‘system’ of interrelated steps, issues and/or factors. A number of techniques were utilised including further specific interviews with participants, photographic documentation and analysis using role playing, system diagrams and mind mapping. This resulted in the development of a set of design parameters i.e., a clearly defined opportunity to explore and ‘solve.’

A number of creative tools were then used to drive a divergent and convergent a creative design process. Students were encouraged to think laterally about the problem, and without necessarily exploring and relying on physical product outcomes. Students were reminded of the word ‘intervention’ to assist people to begin to change behaviours as a creative trigger. Further more specific research was also encouraged at this point in the process to underpin and inform the creative process including life-cycle analysis if appropriate.

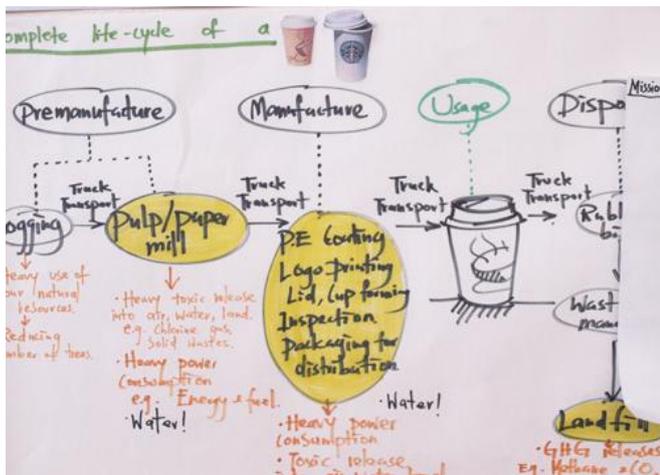


Fig. 2. Example of student Life-Cycle diagram.

### 3. Design.

Informed by critique and analysis of the exploration phase, possible design solutions were then identified. These were interegrated by students in class session and small group situations. Students were encouraged to quickly and effectively further explore ideas in drawings, quick 3D models and prototypes if appropriate, system diagrams, models and virtual mock-ups for testing and evaluation. From this a final design proposal was developed and presented to class in a formal critique session. Students were encouraged to engage their participants with their design proposals and to report feedback.

The following represents an example of three approaches and design outcomes to the project.

#### 1. Clingfilm Replacement

Driven by the Cradle to Cradle principles this project explored a replacement for disposable Clingfilm food wrap. Based on principle of the vacuum freezer bag, this solution offers the user a reusable, food storage and transportation (Lunchbox) solution.



Fig. 3. Model of ‘Lunchbox’ design proposal

#### 2. ‘Second Life’ Paper Coffee Cups

In this project the student has explored opportunities to confront consumers about the impact of disposable recyclable coffee cups, of which billions are placed in landfills each year, and help consumers to ‘consider’ opportunities for reuse. The proposed solutions engage consumers with a series of humorous and thought provoking ‘second life’ creative opportunities for coffee cups. This is achieved through hand-drawn product graphics and branding.



Fig. 4. Model of ‘Second Life Coffee Cups’ design proposal

#### 3. Hidden Messages

This project moves beyond a product solution to provide domestic bathroom users with hidden messages which appear when activated by water use. The messages remind the users of the impacts of excessive water usage.



Fig. 5. Example from 'Hidden Messages' design proposal.

## VII. CONCLUSIONS

It is essential that universities and institutions of higher learning engage students with sustainability and it is also essential that teaching of sustainable design is embedded deeply into the curriculum of design programmes. This paper has presented an initial approach undertaken by the new product design programme at AUT University through a second year product design project that has begun to engage students with the complex issues of sustainability and sustainable design thinking.

Anecdotal evidence has indicated that, while initially the majority of students seemed to have some understanding of issues surrounding sustainability and did not seem to grasp the breadth, depth, scale and complexity of the issues, it appears that students have become much more interested, motivated and engaged by sustainability throughout project. Further to this, class discussions have indicated that students have also become much more aware of their own 'unsustainable' behaviors and of those of their friends and families. Many have also indicated that they have now begun to engage and debate sustainability issues with them as well. The design outcomes produced by students have also demonstrated the use of 'design thinking' to push beyond physical 3D products to higher level services and system based solutions.

It is envisioned that a version of this project will be repeated in future academic years. Critical reflection has identified a number of potential changes and improvements to the project. Initial thoughts include:

- Developing a more compressive introduction to sustainability and sustainable design through other papers such as technology and human-centered design. This will provide a more holistic and embedded approach in the programme.
- Engaging with experts in areas of psychology to allow students to engage more deeply with issues around human behaviour change.
- Requiring students to undertake a reflective journal to record personal thoughts and perspectives throughout the journey of the project.

Further to this, and to assist in the further development and integration of sustainable design in the product design programme, a formal research project is proposed to survey student attitudes and understandings of sustainability before and after the project to formally assess and evaluate engagement and attitudinal change.

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