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Re-design: *in pursuit of a sustainable future*

Abstract

Textile designers in the twenty first century must be flexible, innovative and creative in order to respond to an increasingly complex and interconnected world. They must have a diverse skill set and understanding of design aesthetics, market awareness, traditional hand crafted textile techniques, as well as new materials, technology and manufacturing processes. But in today's world is this enough? With the challenges that climate change present, designers need to rethink their approach by adopting a 'cradle to cradle' philosophy.

Consider that the environmental impact of a product is 'locked' into the product at the design stage (Lewis, 2001). Given this, textile designers along with fashion, industrial and other design related disciplines have a responsibility to understand the life-cycle of the product. Designers need to develop a design framework and knowledge base that ensures environmental impact is minimised, and where possible eliminated, from all stages of a product's life-cycle. This means moving beyond merely being concerned and aware of environmental issues, to implementing a holistic and collaborative approach, in order to provide meaningful sustainable design solutions.

The paper will discuss, through the use of examples from the research project 'Re-design' involving students on the BA Textile Design program at RMIT University, Australia, how such a framework for design is possible. It will argue that taking a holistic outlook, such as life-cycle assessment, is now an essential tool for designers.

Introduction

Today we face a multiplicity of issues; climate change, unsustainable patterns of consumption with resources and energy use, excessive waste and pollution resulting in environmental degradation, and the social consequences of these. How do we begin to solve these complex and interrelated problems? How can designers be truly effective and contribute to a sustainable future?

For the fashion and textile industry this is particularly pertinent. It would seem we are at a significant juncture. We could continue with the current trend of 'fast fashion', with fashion becoming faster and cheaper, seemingly built on 'planned obsolescence' and the supply chain more fragmented and complex (Black, 2008: 11). Or can it be, through 'good' design that an alternative paradigm emerges that reconciles the need of economic growth with sustainable development that eliminates negative environmental and social impacts to ensure an improved quality of life and well-being for individuals.

This paper will discuss how design (specifically textile design) is essential to providing innovative and sustainable solutions for the fashion and textile industry. This means reassessing the design process to take a holistic and collaborative approach to

product development. In particular, textile designers need to ensure they have a depth of knowledge of their discipline, as well as a breadth of understanding of the environmental, social and economic context in which they design. How such an approach is possible is demonstrated through the research project 'Re-design' involving students on the BA Textile Design program at RMIT University, Australia.

Sustainability and well-being

When the concept of well-being is considered, terms such as happiness, health, welfare, comfort, safety and security come to mind. It is about having 'quality of life'. When applied to fashion, these terms connect directly to the individual; through the relationship clothing has to the body. It is much more than merely being a means of providing basic protection from the elements. Clothing can provide "a means to express identity – whether personal, political, religious, or cultural" (Hodge, 2006: 11). What you wear reflects who you are, what you think. It is a very personal response to the world around you.

The connection between well-being and fashion is physical, physiological, as well as metaphorical. It is physical: what is the garment made from, does it give off toxins? It is physiological: how does the colour, textile pattern or design make you feel, does it change your mood? It is metaphorical: does your garment reflect your social values, your ethics?

But well-being today needs to be viewed as much more encompassing. For the individual to thrive a holistic view of well-being must be taken into account. In particular, considerations of sustainability in its broadest meaning must be integrated.

'Sustainability' (also referred to as sustainable development) is defined as being "the framework for our efforts to achieve a higher quality of life for all people," in which "economic development, social development and environmental protection are interdependent and mutually reinforcing components" (UNHSP, 2006: 2). The key objectives of sustainability are: eradicating poverty, protecting natural resources, and changing unsustainable production and consumption patterns (UNHSP, 2006: 2). With this in mind, sustainability is about providing a 'quality of life', be it for present or future generations, by balancing the needs of environmental and economic, as well as social justice and ethical considerations.

For fashion to be truly sustainable, the fashion and textile industry has a responsibility to provide a quality of life not just to the consumer, but to all employees, as well as respect for the natural environment, through all stages of the product's (clothing) life-cycle, from production, use and disposal. *"Worldwide, more than 32 million people are employed in clothing production and its related activities. Especially in developing countries, this industry, which accounts for 42 percent of exported consumer goods, has the potential to serve as an engine for economic growth and industrialization"* (Braungart, 2007: 190).

The industry, however can also do a lot of harm to natural and social systems. For industrialised countries current use, depletion and waste of resources are anything but sustainable. At present, industrialised countries consume more than 80% of the world's resources and generate 80% of all waste, although they only contain 20% of the world population (Charter & Tischner, 2001: 124).

For developing countries, increasing their level of consumption is seen as an important part to improving their overall 'quality of life' (Charter & Tischner, 2001: 123). But if replicating present the patterns of consumption of developed countries is not a solution for developing countries, then what is? This is the challenge of sustainability. How can developing countries improve their quality of life, without further exacerbating environmental and social problems? And how can developed countries move away from current patterns of consumption but still maintain their standard of living? As "Katherine Hamnett reiterates: '*How we consume shapes the future of the planet.*'" (Black, 2008: 11).

If 'sustainability' means in practical terms, placing limits on the consumption of resources, how does this affect the fashion and textile industry? How can designers and in particular textile designers contribute positively to a sustainable future? Strategies for change are needed.

Redefining the role of textile designers

Textile designers, deal primarily with the design (creation or attention) of a 'surface' usually in the form of fabric that is either decorative and/or structural. The decorative focuses on the application of pattern to the surface, using a range of textile techniques such as printing, embroidery or fabric manipulation. In contrast, structural textiles explore the 'bones' of a cloth and is constructed, through techniques such as knitting, weaving or non-wovens.

In doing this, textile designers explore ideas and realise their concepts within a commercial environment. Emphasis is placed on translating textile concepts into marketable products for the particular end-use. Textile designers can work in a wide range of sectors from fashion, interior, forecasting to automotive industries.

The design process usually begins with research on trend forecasting (such as colour, theme, pattern, yarn, fabric and styling directions) and market awareness (such as customer analysis and store visits to see what's out in the marketplace). From here the textile designer develops a personal design approach that influences their choice of materials, motifs and textile techniques. They would then expand on their initial ideas to develop a range of concepts. These concepts could include storyboards, croquis, traditional hand generated (paint-ups) and digital designs in repeat through to actual fabric samples. The finished designs would then be developed further into the eventual product, which the textile designer may or may not be involved in.

This approach to design fits a conventional design process, where design is relatively linear and focussed. There is a strong emphasis placed on aesthetics, functionality and commercial viability. Is there a market for the intended outcome? Will it sell? The focus is on the end-use; or perhaps more precisely on the 'moment' of the product's life when it is sold.

This was once considered the textile designer's job and it extended no further. The product's life was only considered in terms of traditional commercial goals. For example could the cost be lowered by the selection of raw materials or through

changing how it was manufactured? Would this result in greater sales? Questions to do with the product's retirement; its ability to be recycled, energy use, waste management and pollution were not considered. Likewise, the product's ethical or social justice credentials were rarely considered.

However, today the designers' role needs to be broadened. What makes for 'good' design is more than aesthetics and traditional economic goals. For growing numbers of consumers and designers alike questions to do with social and environmental concerns are at the forefront of their thinking.

Customers are questioning all aspects of the textile supply chain and product's life-cycle, as well as their own patterns of consumption. For example what is the product made of? Where was it made and by whom? It is environmentally and ethically sustainable? Does it contribute to Fair Trade? Customers increasingly look to their purchases as having a moral, social, and environmental dimension. Do you feel comfortable wearing a garment that is made from unethical practices, that is harmful to the producer's health or to the natural environment? This view is as much about the individual as it is the collective. In addition, customers are reflecting on their own buying patterns and questioning the continual 'need' to consume. For many consider "the pressure to constantly re-formulate identity instigated by changing fashion trends feeds insecurity" (Fletcher, 2008: 117).

At the same time, designers are realising they are in a unique position to act. For 'good' design to occur, designers need to be aware of the consequences of their creative decisions and the impact they have on the life of the product. For textile

design this means moving beyond the 'surface' of what a conventional design process takes into account.

Instead a more holistic and collaborative approach is needed in order to provide meaningful sustainable design solutions. Consider that "*environmental impacts occur at all stages of a product's life-cycle... No matter where in the product life-cycle the impact lies, most of the impact is 'locked' into the product at the design stage when materials are selected and product performance is largely determined*" (Lewis, 2001: 13). Therefore designers need to take into account a range of environmental factors, from the raw selection and depletion of natural resources, to pollution and waste management, and to the economic consequences as it affects social justice. Ultimately, textile designers need to develop a design process that incorporates sustainable design principles, and to understand the life-cycle of the product.

This reflects a growing trend with the broader design community, with significant research being done by design theorists such as Victor Papanek, Ezio Manzini, William McDonough and Michael Braungart (Black, 2008: 53). Particularly useful and relevant is the work of William McDonough and Michael Braungart (McDonough & Braungart, 2002), who advocate designing 'less bad is not good' and that designers need to adopt a 'cradle to cradle' philosophy so that products at the end of their useful life, become 'ingredients' for new products.

While sustainability is now consistently taken into account as part of contemporary architecture and product design, "the same approach has not yet been automatically and comprehensively applied to fashion design, which is also a form of product

development but one which operates within its constantly changing remit” (Black, 2008: 50). Fashion has always been considered as ephemeral; designed not to last. However, today fashion and textile designers need to look at what happens when the clothing has fulfilled its usefulness and how it can become the *ingredients* for new products. This is a very critical issue given “we now consume one third more clothing than even four years ago, according to a Cambridge University report, and discard it after wearing just a few times or indeed, even once” (Black, 2008: 14). If landfill is no longer an acceptable end point, then what options are available?

When designers start to incorporate principles of sustainable design what emerges is a new way of thinking about design that looks at a design problem through a systems rather than artefact approach. For textile designers this means rather than concentrating exclusively upon a fabric’s appearance, textile designers need to develop ‘ecologically intelligent’ fabrics that involve a re-assessment of all the materials and processes used in the system of fabric production and its supply chain (Colchester, 2007: 60).

Re-design

Sustainable design consists of a decision-making process directed at achieving maximum benefits with minimum use of resources, by integrating economic, social, and ecological concerns (Giudice, La Rosa & Risitano, 2006: 29). Such an approach for textile design is demonstrated through the research project ‘Re-design’. This involved students on the BA Textile Design program at RMIT University, Australia, who looked beyond conventional textile design process and began to incorporate sustainable practices.

The 're-design' project asked students to undertake active research by examining and reflecting on their design process for the studio based project 'Craftlife'¹. The overarching aim was to design a range of fabric swatches for an appropriate end use. Emphasis was placed on extending the student's sense of fabric making and surface decoration through awareness of traditional handmade textile craft practices and sustainable approaches to design. By being a hands-on project, it brought into context the issues of sustainability and how designer's creative decisions can affect a product's impact on the environment and the consumer's patterns of consumption. The key learning outcome was a written and visual research report that would support their design outcomes.

Importantly, the project reflects how textile designers can examine and take into account the principles of sustainability with their design practice, and in doing so redefine their role as a designer.

Central to developing a sustainable design approach is an understanding of Life Cycle Assessment (LCA) (Giudice, La Rosa & Risitano, 2006) (Lewis, 2001). LCA is a tool to assist with developing strategies for sustainable design, by allowing the designer or design team to identify and evaluate all the environmental impacts that comprise the product from 'cradle to grave' or better still 'cradle to cradle'. It consists of two parts: the 'Development cycle' being the product design & development, and the 'Physical cycle' being all the phases the product passes through during its physical life (Giudice, La Rosa & Risitano 2006: 40)

To begin with students focused on the physical cycle of their proposed textile product; this being a fashion garment, accessory or a home-ware product. Students had to consider the most significant environmental impacts of each of the key life-cycle stages. This included *raw materials* (acquisition, fibre type), *manufacturing* (yarn, fabric, product manufacture and textile techniques), *use* (consumer use, maintenance and repair), *retirement* (recycling options), as well as *distribution* (transportation and storage) and *packaging* (throughout the various stages of the product's life). In doing so, they needed to actively implement ways to minimise, and where possible, to eliminate these identified impacts. This involved seeing their design process as cyclic with continual feedback processes built into it. This was both reflective and active research and design.

As students began their design work they undertook a series of lectures and workshops to understand the context in which they were being asked to operate; the idea being they should 'think global, but act local'. Specifically, students learnt about climate change and associated issues of resource and energy use, with particular reference to Australia's position; the interconnectedness of environmental, social and economic issues; the fashion and textile industry's relationship to this; and then how designer's could contribute positively - looking towards possible solutions. This was about raising awareness, of developing critical thinking and of understanding the importance of taking a multiplicity of approaches by balancing the complexities of macro problems with micro solutions. This meant that as students developed their initial design ideas, sustainability was at the forefront of their thinking. Research into trend forecasting, market awareness and exploration of textile techniques was

combined with research into sustainability. Each research element had to support the other.

The project '*Recycling Warrior*' by the student Jessica Eisenhaur is a good example of this process and how the principles of sustainability can be embedded at a number of levels (Image 1). '*Recycling Warrior*', explored the idea of redesigning an all-purpose shopping bag, to replace the supermarket plastic bag and non-recyclable 'green bag'. The project blended conventional textile design skills with sustainable thinking. The products success was ultimately dependent on the interconnectedness of design aesthetics, functionality and product marketability with sustainable thinking.



Image 1: *Recycling Warrior*, by Jessica Eisenhaur, 1st year Textile Design student, RMIT University, 2008

One of the first choices made was about material selection and how this impacted on the products longevity and potential retirement options. What are better natural, synthetic, organic, recycled, or blended fibres? These are complex choices and impact greatly on the ease of which the textile can be recycled or re-used. When considering the choice of materials, the suitability of the fibre first needs to be taken

into account. How will it perform in its life verses retirement? Which is the greater consideration? For example blended fibre content can help extends the textile's use, and reduce its energy consumption, by needing less laundering, but post-life it makes it more difficult to recycle.

When making this selection, natural fibres can seem the obvious choice, but may not necessarily be better. For example the growing of cotton uses a huge amount of water (a significant issue in Australia) and chemical pesticides and fertilisers makes it less than ideal environmentally or for human health. The alternative, organic cotton, addresses some of these, but the yields are considerably lower, therefore, not as productive per hectare compared to standard cotton. As well there is an array of newer 'natural' fibres to choice from. For example bamboo has some good environmental credentials; particularly with its fast growth, it can be renewed quickly and can grow in a variety of climates. But from bamboo to bamboo fibre, it must undergo significant processes. At present there are two methods of converting, one costs less but uses chemicals, while the other method converts the fibre through mechanical means but is more costly (Delano, 2007: 166). These choices must be weighed up.

For 'Warrior Recycling' Eisenhaur, decided on the use of jute fibre and that this had to come from second hand sources. Essentially no new raw materials were used. Thus jute was sourced from discarded Hessian sacks used for packaging of coffee beans and wheat.

The fibre jute was selected for its sustainability credentials. It is a 100% biodegradable natural vegetable fibre, is very strong and one of the cheapest fibres available. It is carbon dioxide neutral and improves soil quality. Studies indicate that, one hectare of jute plants can consume up to 15 tons of carbon dioxide and release 11 tons of oxygen during the jute growing season (about 100 days) (Natural Environment Blog, 2008). In addition typical jute agricultural practices are also environmentally sound as they cause minimal impact to the natural environment. This choice ensured the bag would be durable and long-lasting.

The construction of the bag was simple to ensure zero waste of the Hessian. As well, the 'decorative' surface work was designed to enhance the products appeal. The bags were embellished with bright coloured threads, naive stitching in an illustrative style, and waste materials, such as leather off-cuts and small plastic fish soy sauce bottles, that would otherwise be thrown away. In doing so, inspiration was drawn from African cultures and their use of strong geometric shapes and patterning as well as the idea that everyday 'rubbish' can be turned into an object of beauty. This emphasis on customisation makes the bags visually more appealing and personal, thus becoming a reason to be kept and re-used.

In addition to focusing on the physical cycle of the textile product, students also reflected on their own design process (the development cycle) and how they could implement more sustainable working practices.

Students looked at how they went about designing; their use of resources, the waste generated from this and energy consumption used. For example they looked at how

their studio space was set up; what it consisted of, such as a computer, sewing machine, electricity, lighting and heating, TV and so on. What was the energy use of working at night versus during the day? How much waste was generated in terms of paper and materials (fabric)? If a small piece of fabric was cut out of a garment, rendering it unusable, then how 'good' was the design process? For many students this was a surprise and led directly to changes. For example students developed schemes to sort the waste they generated so in the future it could feedback into another projects. This included paper, yarn and fabric (by fibre type and colour). Many students stated their intention to maintain these practices and expand on these systems to all aspects of their working practice and home life.

Conclusion

The redesign project highlights the need for textile designers to adopt a more holistic approach in order to contribute to a sustainable society, which ensures quality of life, human well-being and protection of natural systems. For textile designers this means moving beyond conventional design tools of aesthetics, functionality and product marketability. Through research and self-reflection the design process ultimately needs to support a framework for sustainable design that ensures environmental impact can be minimised, and/or eliminated, from all stages of a product's life cycle. By using tools such as LCA designers can begin to understand and actively influence how their creative decisions can impact the life and post-life options of the product.

Endnote

1. Craftlife project was run in collaboration with the lecturer Verity Prideaux.

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