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## **The role of craft in a co-design system for sustainable fashion**

### **Abstract**

The relationship between craft and design has been the subject of much discourse. Press and Cushworth (1997) have suggested that craft knowledge is fundamental to developing a vision of design in a “post-industrial future”, and McCullough (1998, cited in Kettley, 2005: 2) supported this, noting “there remains a realm where scientific production cannot go, where mechanized industry finds too little demand to go, and where artistic discourses dare not go...there we find craft”. Contradictory to existing industrial-scale design processes, craft values social engagement and knowledge-sharing, is reflective and produces authentic products imbued with cultural meaning. It is these characteristics which suggest that craft has a significant role to play in developing sustainable practices. This paper explores the role of craft in supporting sustainable fashion design, production and consumption.

In recent years a number of DIY craft and fashion micro-productions have emerged throughout the fashion and textile industries through the fusion of the design and making process. Fletcher (2008) has proposed that more participatory models of fashion design, “User Maker” systems in which consumers become co-partners in the process, may encourage more sustainable consumption. However, the adoption of co-design for sustainable fashion is in its early stages; the evolution in design research from a user-centered approach to co-design is changing the role of the designer and the implication of this shift for the education of designers and researchers are enormous (Sanders & Stappers, 2008).

This paper will review the post-Industrial Revolution historical context and identify the key factors which make the current fashion design process unsustainable. It proposes an alternative craft-based design and production model in which emphasis is placed on integrating sustainability within the design development process and embedding education through co-creativity as social process, providing a system in which users are encouraged to explore sustainability as a way of thinking and continually reflect on the environmental and social impacts throughout the product life cycle.

The model offers initiatives ranging from the simple involvement in the product development process to more complex 'idea generation toolkits', allowing individuals and organizations to engage to different extents with the system. The idea generation toolkits serve to help people understand the context for sustainable fashion and encourage them to create new solutions, both in terms of sustainable consumption or through sustainable co-creation using a 'learning by doing' process. As such, it integrates the design process, linking sustainable production and consumption.

The paper will also discuss the ongoing development of a web platform which fulfils part of this model. This website utilizes design thinking to provide learning and sharing environment, encouraging co-design activities which allow enterprises to develop ideas internally or through communication with the consumer. Consequently, people can collaboratively build an inspirational source through a 'learning, making, sharing' process and progress from surface to deep engagement with sustainable fashion. This flexible design process allows for active participation from multiple disciplines and generates solutions which address a range of sustainable design issues.

## **Introduction**

It is generally accepted that the fashion and textiles are amongst the most unsustainable of modern industries. Their environmental impact has been likened to that of the chemical industry (significant impacts occur at every stage in the product lifecycle), and there are numerous examples of worker exploitation within the supply chain. Furthermore, unsustainable consumption is encouraged by the predominance of 'fast fashion'; its characteristic features of homogenised high volume, low price fashion goods drives greater levels of consumption; products are less able to satisfy a consumer's need for differentiation which, it has been argued, leads to a reduction in emotional and symbolic value of a fashion product, and an increase in turnover of goods and in the resultant volumes of waste (Fletcher, 2008).

As the industry has become increasingly globalised, the role of the fashion designer has changed significantly. From the 'designer maker' model which characterised pre-industrial mass production, the designer has become increasingly disengaged from the production process and its attendant impacts. Indeed, in the most extreme cases, a fashion designer may never handle the material that their carefully conceived product is to be made up in, or know its provenance (Van Koppeln and Vaughan, 2003). A similar disengagement of the designer-consumer relationship is evident when the traditional practices of couturier, tailor and dressmaker are compared to modern mass-production methods. The knowledge that the designer holds of consumer wants and needs is second-hand, and does not generally play a role in the design and development process (Vaughan, 2006). This has two potential consequences for sustainable design: firstly, the true desires of the consumer may be lost in translation (Van Koppeln and Vaughan, 2003); secondly, opportunities to enhance the consumer's connection to the product are missed (Vaughan, 2006). Finally, and perhaps most challenging, the relationship between designer and the product has become disengaged. The demand from the consumer for 'newness' shortens the available time for idea generation; this, coupled with the need to reduce the financial risk of missing a key trend, limits the potential for individual creativity which is, ironically, in enormous demand from employers. These various separations pose a challenge for sustainable fashion design.

In contrast, a recent paper by Kiem (2011) uses the philosophies of Fry and Heidegger to elucidate three ways in which craft processes and their material outcomes engage their makers and users. Firstly, craft practice and its associated experience and knowledge can encourage more thoughtful approaches to design and a deeper understanding of the artifact's lifetime. Secondly, craft practice may give rise to what Kiem terms 'care in use' (2011:8), in that the maker is more aware and considerate of the user and their relationship with the artifact. Finally, there is the concept of Tonkinwise's 'beauty in use' (Tonkinwise 2004:66, cited in Kiem, 2011) where artifacts are no longer simply viewed as functional objects or as symbolic representations, but contribute to the user's experience of the world around them. Kiem argues that 'beauty in use' is likely to encourage emotional relationships with products and lengthen their useful life.

Of course, that is not to say that craft practices are inherently sustainable. If sustainability is considered to be a combination of economic, environmental, social and cultural factors, the social and cultural elements predominate in crafts and it is not

realistic to expect that craft production can entirely replace mass-production. However, distributed making through digital craft production as explored by Marshall and Bunnell (2009) has the potential to extend the impact of craft and there has been significant research and development work in this area, as noted briefly later in this paper. With regard to environmental factors, knowledge and understanding of the environmental impact of materials, processes and consumption patterns is distributed through a range of disciplines and philosophies; individuals may not possess a broad awareness of new approaches to sustainable products and services. Under these circumstances, new approaches to craft practices may be neglected. This is particularly the case for a generation of artisans who have not been exposed to the emphasis on sustainable practice which is increasingly a characteristic of craft education.

Despite these issues, Kiem (2011) argues that craft has the power for transformative change. In particular, he notes its potential for engaging the consumer, drawing parallels between the process of making and Borgmann's 'focal practices' (Borgmann, cited in Kiem, 2011:18) – activities which engage individuals and equipment in the development of skills to achieve a fulfilling end goal. Similarly, Csikszentmihalyi (1996) suggests that active engagement in the design and making process encourages human wellbeing, arguing that "...Happiness comes from creating new things and making discoveries. Enhancing one's creativity may therefore also enhance well-being." He notes that connecting between this flow and happiness depends on whether the flow-producing activity is complex, whether it leads to new challenges and hence to personal and cultural growth (Csikszentmihalyi, 1996).

It becomes apparent, then, that, provided that artisans have access to information on the latest thinking in environmental, social and cultural aspects of sustainability, craft can make a significant impact on the sustainability agenda, even raising questions regarding the long-term sustainability of the existing economic system. Furthermore, we argue that the concept of 'focal practices' indicates that, rather than simply being the consumers of the end product of a craft practice, this potential is best realised with maker and user work together – in other words, through co-design.

## **The potential for co-design in a craft-based fashion system**

As has already been noted, historically there has been an intimate relationship between makers and users of apparel. However, with the onset of mass production, these practices have become the province of haute couture and high-value products (for example, wedding dresses). Despite this, Sanders (2006) identified that in recent years,

the nature of the 'consumer' has changed; they are no longer satisfied with a passive role in consumption, but wish to be 'co-creators'. She identified four levels of creativity that are sought by them in everyday life which vary in the degree of engagement and motivations depending on their level of expertise, passion and individual creativity.

At the basic level, 'doing' requires a very low level of engagement and knowledge; 'doing' is productive activity which is undertaken as a means to an end. The second level of creativity 'adapting' is motivated by the desire to appropriate a product; it engenders some interest in a product and requires a small degree of skill, knowledge and experience. Beyond adaptation, the third level of creativity, 'making', requires a genuine interest and experience in the making process; the desire to create a new product is an assertion of skills possessed. The highest level of creativity is termed by Sanders as 'creating'; an expression of individual creativity and guided by a high level of experience. It differs from making in that there is the absence of a predetermined outcome. The forms of creativity, their motivations and requirements are summarized in Table 1.

Level of creativity	Motivation	Requirements
Doing	To get something done/ to be productive	Minimal interest Minimal domain experience
Adopting	To make something on my own	Some interest Some domain expertise
Making	To make something with my own hands and mind	Genuine interest Domain experience
Creating	To express my creativity	Passion Domain expertise

*Table 1, Four levels of everyday creativity (from Sanders, 2006)*

Sanders (2006) argues that all individuals are capable of reaching the 'creating' phase, provided they have the desire to do so; however, standard approaches to craft and design in which the maker has control of the process do not provide support for the creative consumer. She proposes a range of 'design spaces' which enable each type of creativity, where designers provide tools which match the degree of engagement the individual desires in the process. At the highest level, Sanders proposes that co-design/ co-creation spaces allow makers and users to work collaboratively and explore their creativity together.

When we reflect on co-design as practiced in the mass market, it is most common to see frameworks which allow for consumer involvement at the 'doing' and 'adapting' levels and facilitate this involvement in the latter stages of the design process, largely in the marketing and sales stage. For example, the construction of flat-pack furniture such as

IKEA is creativity at the 'doing' level. Clear instructions are given for the completion of products, and these are followed by rote by the consumer, motivated by productivity. In fashion, 'adapting' is dominant. There are a number of tools and services which provide the consumer with the opportunity to customize their clothing; for example Nike, through their NIKEiD online tool allow consumers to select a range of predetermined shoe styles, soles and colours and personalize these with their own message.

In recent years, however, there are a growing number of DIY craft and fashion micro-producers who are embracing codesign activities at the 'making' level. Otto van Busch, on his [www.selfpassage.org](http://www.selfpassage.org) website provides 'reform cookbooks' which encourage individuals with some skill in making to redesign old clothing. Equally, local scale projects such as the ubiquitous 'stitch and bitch' workshops provide spaces for skills development and, as confidence develops, co-creation.

Other making tools have been developed in other fields such as industrial design and architecture; for example [www.automake.co.uk](http://www.automake.co.uk) is a design platform which integrates generative digital systems and digital production techniques. Automake explores the boundaries between consumer and maker, and hand craft and digital production technologies including rapid prototyping/ manufacturing technologies and CNC equipment to allow participation at the adapting and making levels (Bunnell and Marshall, 2009).

Perhaps one of the most extensive craft micro-production networks is [www.ponoko.com](http://www.ponoko.com) which brings together creators, material suppliers, digital fabricators, DIYers & buyers in a collaborative design environment. The Ponoko platform allows users to select the creative level at which they wish to work. For individuals satisfied with the doing/adapting levels, one 'making app' involves the selection and customisation of readily available designs; for more experienced designers/craftsmen an alternative 'making app' allows for products to be designed based on templates or from scratch, providing scope for them to interact and the making and creating levels. There is also the potential for designers to contribute their own 'making apps' to facilitate others' creativity. Thousands of user generated products have been created through online platform and made locally, building close connections between the consumer and other stakeholders. The Ponoko model facilitates micro-manufacture and reduces the impact of the transportation stage of the product lifecycle.

Whilst there is a plethora of excellent tools for developing craft skills and facilitating distributed production, there are still very few which encourage these skills to be employed in the context of a deeper understanding of sustainability; few question the fundamental design concepts and associated issues. It seems apparent that further tools require a new emphasis on both creativity *and* education in order to raise awareness, understanding and to generate new solutions for craft and fashion design practitioners to rethink the design process. This is the aim of the Sustainable Fashion Bridges project.

## **The Sustainable Fashion Bridges Ideation Toolkit: Co-design in the early stages of the design process**

The Sustainable Fashion Bridges (SFB) Ideation Toolkit is designed to facilitate co-design in the 'fuzzy front end' of the early design process, characterised by open-ended questions which are used to define the design problem and a point at which what is to be produced is not determined. It is at this stage that Sanders and Simons (2009) have suggested that the most significant social and environmental benefits can be attained. The ideation toolkit is a design thinking tool which is intended to encourage participants in the design process to consider sustainability from the very beginning. Using a similar approach to Lockton's 'Design with Intent' idea generation tool (Lockton et al, 2008), the toolkit utilises provocative questions which address sustainability concerns at every stage of the fashion design lifecycle. The questions have been categorised into six key themes or 'design patterns': Choice; Optimisation; Empowerment; Persuasion; Interaction; and Social Conversation. The ideation toolkit is shown in Figure 1 and a brief description of the various themes is given in Table 2.



*Figure 1: Sustainable Fashion Bridges Ideation toolkit*

	Description of the six design patterns
<b>Choice</b>	<p>The Choice pattern considers our resource use throughout the clothing lifecycle. Our behaviour as designers and users has significant environmental and social impact. Choice patterns encourage individuals to take responsibility for their actions, by reflecting on and rethinking their use of resources; choice questions encourage experimentation in material, process and application</p> <p>Choice cards cover:</p> <p><b>Alternative Materials? /Alternative Energy? / Alternative Process? /Alternative clothing packaging? / Alternative Distribution? / Ways of Buying? / Ways of Wearing? / Ways of Maintaining? / Ways of Washing?/ Ways of Disposal?</b></p>
<b>Optimisation</b>	<p>Optimisation seeks ways to maximise the positive impact of the product and system by intervening in the clothing life cycle, and hence changing the degree of flexibility of design. Optimisation may involve the re-imagination of the clothing life cycle system, turning it upside down, merging, skipping, segmenting, suggesting flexible manufacturing systems and alternative service design rather than one-size-fits-all.</p> <p>Optimisation cards cover:</p> <p><b>Rethinking durability? / Biomimicry? / Cradle to Cradle?/ Modularity?/ Merging?/Zero-waste? /Dynamic upgrade? / Multi-fashion?/ Updatable systems? /Swap &amp; Share service?</b></p>
<b>Empowerment</b>	<p>Empowerment patterns propose the creation of products and services which can satisfy psychological and social needs both through creating meaningful relationships with the user in the design process and encouraging the user of to engage more actively in the process and with the product or service.</p> <p>Empowerment cards cover:</p> <p><b>Storytelling?/ Magic? /Poetic? /Playfulness?/ Personalisation?/ Partial completion? / User as maker service?/ Smart Craft? / Open source fashion? / Cultivating creativity?</b></p>
<b>Persuasion</b>	<p>Persuasion patterns play a supportive role in motivating people to engage in positive behaviour, and granting immediate rewards when they do so.</p> <p>Persuasion cards cover:</p> <p><b>Information? /Ways of guidance?/ Story of Use?/ Transparency?/ Warning? Reinforcement?/ Reward? /Simplicity?/ Commitment?/ Shareholder Incentive?</b></p>
<b>Interaction</b>	<p>Interaction patterns explore the idea of automatic responses in the product/user relationship. They challenge bad habit and routines, and reinforce unconscious positive behaviour.</p> <p>Interaction cards cover:</p> <p><b>Sensory Effects?/ Parameter Change?/ Reactive fashion?/ Preliminary Action?/ Segmentation?/ Navigation? /Tailoring?/ Notification? / Feedforward? / Behaviour feedback?</b></p>
<b>Social Conversation</b>	<p>Social Conversation influences the effectiveness of social learning, including the concepts of creative communities and open-source. Social Conversation encourages people to interact on a local level and helps participants to develop skills and knowledge, build networks and have confidence to tackle social challenges.</p> <p>Social Conversation cards cover:</p> <p><b>Symbiotic Relationship? / Catalysing Actors? / Enabling Solutions?/ Localisation/ Community Learning?/Creative Enterprise?/ Power Shift?/ Social Feedback? /Social Service?/ Ways of Living?</b></p>

Table 2: SFB's six design patterns



## Using the Sustainable Fashion Bridges ideation toolkit in craft production

When the Sustainable Fashion Bridges ideation toolkit was conceived, it was intended to be used by professional fashion and textile designers and highly engaged users (co-designers) in setting the design brief; the making process would be controlled by the craftsperson. However, since that time, other ways in which the tool can be used have become apparent. Although this paper is concerned with utilising the toolkit in co-design, it can also be used solely by the professional designer to develop more sustainable solutions in the ideation phase; or solely by consumers to make informed decisions when purchasing (case studies of existing products are included on the ideation cards). However, the more innovative uses are in a co-design scenario where designers and users work together in the ideation phase, either on an individual or a group basis. The various categories of users are defined later; Sanders (2008) makes the point that users can become co-designers, but the two terms are not interchangeable; whether a user makes the transition to a co-designer is dependent on levels of expertise, desire and creativity.

The following scenarios provide ways in which the ideation toolkit can facilitate the various levels of creativity.

### How to use the ideation toolkit : The role of the user

#### 1. Users at the 'doing' level: *beginners*

Users utilise the ideation toolkit to explore the design context and to make informed decisions in the idea generation stage. At the 'doing' level, the user has the opportunity to become aware of the sustainable design issues and increase their knowledge regarding the sustainable fashion design. They can follow the practices suggested on the ideation cards. In this case, people require the minimum level of sustainable design knowledge and fashion design skills but have the potential to develop both.

#### 2. Users at the 'adapting' level: *intermediate*

Users can combine at least two or three different ideation cards and personalise their own thinking and ideas to develop concepts which better fit with their personal beliefs, interests and motivations. At the 'adapting' level, the user requires more interest and understanding of sustainable design and the limitations of fashion design. We suggest that this is the entry level for fashion and textile design students; from here they can move towards the 'making' and 'creating' levels.

### 3. Users at the 'making' level: *advanced*

At the 'making' level, the user can address sustainable design concepts at a deeper engagement level and investigate more closely the synthesis of social, environmental and economic issues, using the questions on the ideation cards as a stimulus. Through co-design workshops, the user can share and expand their knowledge with their peer group (in the case of community level workshops) but the guidance of professional designers is essential, if the user wants to realise the product in a sustainable manner. In order to reach this level, users are likely to have expended a lot of time, energy and effort.

### 4. Users at the 'creating' level: *expert*

Users at the 'creating' level can practice sustainable fashion and textile design in more innovative ways. Using the ideation cards, the user can continuously reflect on their actions and consider short, medium and long-term impacts, based on their broader knowledge of sustainable design issues. At the 'creating' level the user can express their creativity supported by professional designers; it is this level where the user has the deepest engagement, greatest understanding and highest skill level, which may rival that of the 'expert' craft practitioner. At the creating level, the user can support others in the 'doing', 'adopting' and 'making' levels. Users at the 'creating' level can act as facilitators in the same way as professional designers and craft practitioners. It is at this level that users can truly become actors for change in the sustainable design movement.

## **The role of professional fashion designers & craft practitioners in co-design**

Professional designers can also use the ideation toolkit in the same ways as the user, depending on their level of understanding of sustainable design. They can rethink and reflect on their current design practices and create new solutions, developing both their understanding and their skills as sustainable designers. However, Sanders and Stappers (2008) have proposed a new role for the designer/maker in co-design, that of facilitator. In this case, their creativity is used to amplify that of users. With the requisite knowledge and understanding, expert craft practitioners can engage users in the development of more sustainable solutions by providing encouragement and guidance to people at all the different levels of creativity. However, many designers are **still not aware of the** wide range of sustainable design issues and potential tools and methods. The ideation toolkit provides the means for fashion designers and craft practitioners to experiment with sustainable design ideas and concepts and then play the role of a 'creative teaser' (van Busch, 2008, cited in Fletcher, 2008) acting as a catalyst for the user's own creativity. This approach to co-design represents a significant change for designers and craft practitioners; rather than a focus on production, it encourages them

to apply their creativity to facilitating user engagement in the design process or extended user-engagement with the product. Figure 2 shows the ideation toolkit in use.



*Figure 2: Ideation toolkit in use at a community level workshop*

Furthermore, when the user establishes a design context and alternative solutions using the ideation tool kit, they may already be, or be motivated to become, sufficiently passionate that they wish to go beyond the concept stage into the development of a real product or service and be involved in the making process. At this 'making' and 'creating' level, users may experience fear of creation as it challenges the norms of their experiences; an easy way of visualized instruction, further development of the making tool would be an essential in co-design system. Therefore, the provision of a 'making' toolkit and appropriate guidance (what Sanders has referred to as 'scaffolding' (2003)) will avoid user confusion during the learning and making process, thereby facilitating engagement. In this stage, designer and craft practitioner can assist the sharing of knowledge and experience more active way. Through this co-design activity by informed participation, users are able to move away from limited concepts and learn new ideas in a social environment; in overcoming the 'fear of creation' they may be motivated to move to the 'creating' level. The making toolkit shown in Figure 3 was provides a visual illustration of how such making tool kits may be developed, allowing the each user to easily understand how to make the product themselves.



Figure 3 Example of making tool: modular fashion: Co-design workshop

The professional designer or craft practitioner can encourage the user to explore a range of different materials such (as paper and discarded clothing) in making their prototype. In this way, they can explore the craft experience of different materials evoking different responses to their initial concept. In order to construct an initial user's own design solutions, the professional designer or craft practitioner (workshop facilitator) can guide and give feedback to user rather than imposing their own solutions. Therefore, the professional designer needs to provide an appropriate design tool which reflects the user's level of skills. The toolkit is likely to be different for each case. In some cases, the professional designer will not be able to support some technical skills and may be working at the edge of their knowledge; at this point, they can suggest other contributors or stakeholders to aid the user to realise their own design concept in their role of facilitator. The different roles of user and maker/designer are summarised in Figure 4.

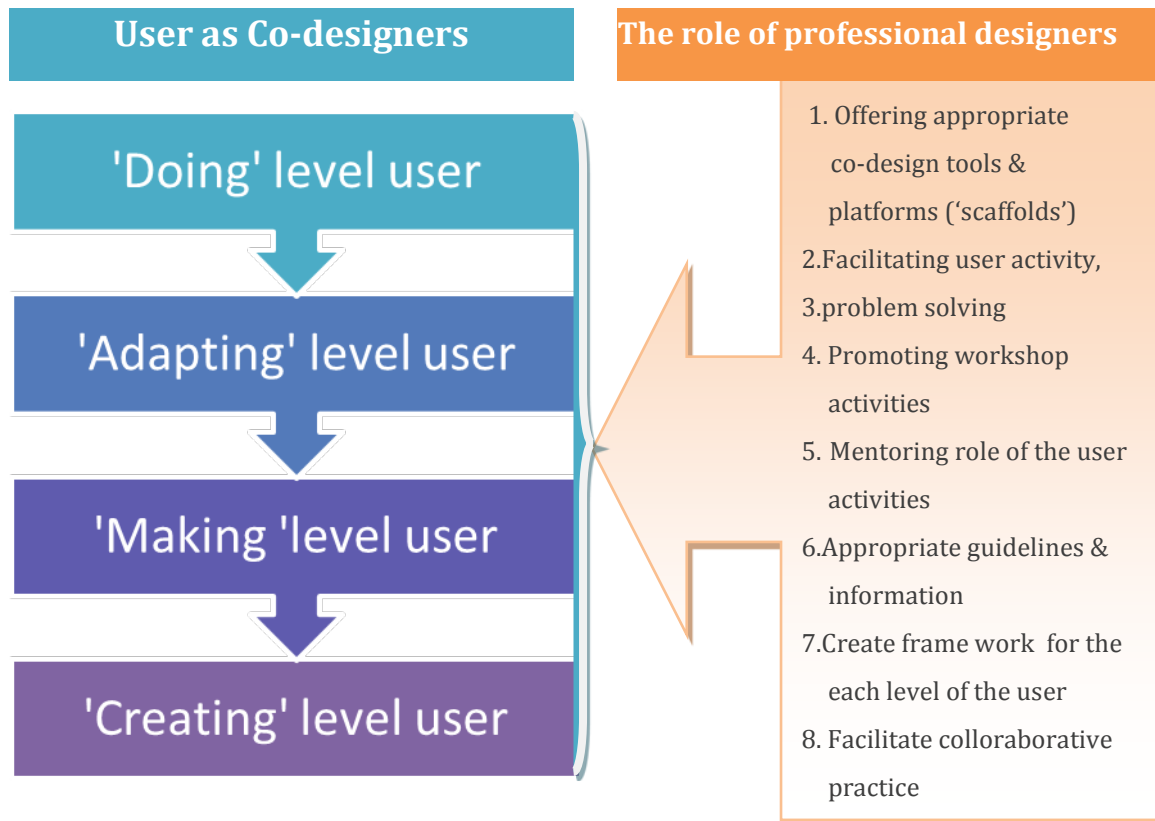


Figure 4: Professional designers & craft practitioners in co-design

## Extending the impact of the Sustainable Fashion Bridges Ideation Toolkit: The Sustainable Fashion Bridges online platform.

Throughout this paper, the importance of developing relationships between the user and fashion design/ craft practitioner has been stressed; on the whole this has been in the context of community level engagement through individual and group workshops. However, this has some limitations in scale of collaboration and sharing of novel outcomes. To overcome these issues, an online platform which allows for a more global level of interaction is being developed. The social design environment will provide a space for interested participants to network and share ideas, concepts and outcomes, and a network of diverse skills and understanding. The web platform has a range of resources which expand on sustainable design thinking and practice, including examples of facilitating 'scaffolds' for encouraging creativity at the 'making' level and standard tools for encouraging creativity which may be used online and offline (for example scenario building). The prototype web interface is shown in Figure 5.

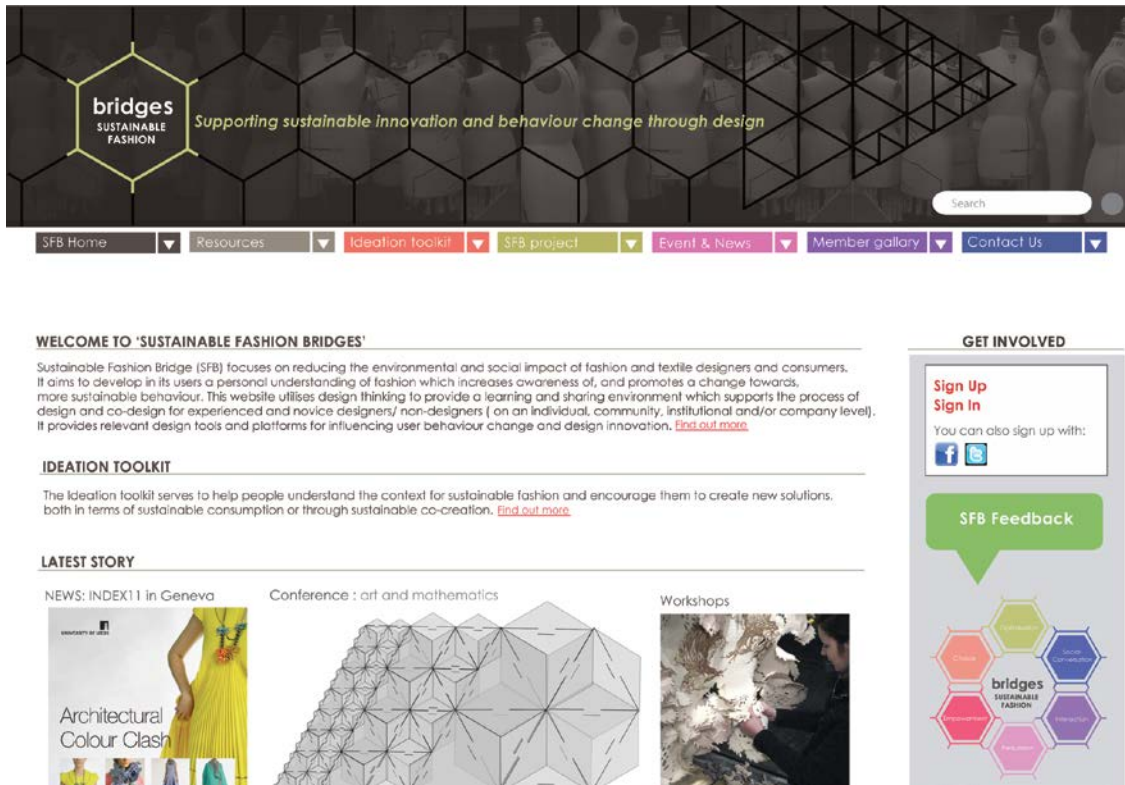


Figure 5: Sustainable Fashion Bridges prototype web platform

The platform enables co-design to take place online. This may be in real time, with designers and users working together virtually and simultaneously, defining a particular problem and generating a range of potential outcomes; alternatively, a problem or outline concept may be proposed and worked on over time as the knowledge base of interested parties expands. The online gallery provides a collaborative space for sharing ideas and outcomes; as such, expertise becomes shared, overcoming the issue of the fragmented understanding of sustainable fashion. The gallery reflects the various 'design patterns' of the ideation toolkit and may feature defined problems, visualised concepts or realised products/prototypes.

## Conclusions

This paper has discussed the potential for fashion designers and craft practitioners to facilitate sustainable fashion solutions through co-design, with emphasis on involving the user at the earliest stages of the design process. Involvement in the early design process allows users with sufficient interest and passion to progress through the four levels of creativity. The Sustainable Fashion Bridges ideation toolkit can be used in a number of ways to facilitate this, depending on the engagement of both practitioner and user. The next stage of this project is to evaluate the effectiveness of the various methods (online and offline) outlined to determine the best use of this resource.

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