

Sustainability in Fashion: Denim Couture

Fatimah Hakeem, Louisiana State University, and Jongeun Kim, PhD, California State University in Northridge, USA

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Significance and Usefulness of the Research

Sustainable fashion has become widespread in the apparel and textile industries. Sustainability is a principle that encourages social and economic awareness and responsibility for creating a balance between human activity and environmental safety (Gurova & Morozova, 2018; Kunz et al., 2016). Applying sustainable design strategies in garment development helps to achieve eco-friendly design. According to Gwilt (2014), upcycling is a sustainable strategy that can be used in a garment's life cycle to minimize fabric waste and improve design techniques during the production process of upcycling.

This project has adopted upcycling by transforming post-consumer jeans into sophisticated new garments. Denim was chosen as a material for this project due to its negative impact on the environment and associated low sustainable fashion practices, recycling in particular (Van Bommel & Goorhuis, 2014).

The purpose of this project is to provide an example practice of how to revitalize discarded clothing to create sustainable designs by upcycling used jeans. This project used innovative ways to improve the value of these designs by manipulating the fabric and creating interesting surface design. Surface design techniques are applied to the garment to change the material's identity and create three-dimensional texture (Wolff, 1996). Also, applying techniques of manipulating fabric in designing garments can be used as a sustainable way to eliminate fabric waste (Parsons, 2015).

Thus, this project produced a contemporary and sustainable couture collection contained seven looks and 14 diverse garments. The silhouette of the collection was inspired by Japanese designers Yohji Yamamoto, Rei Kawakubo, and Issey Miyake, who are masters of manipulating materials to create wearable artworks.

Conceptual Framework

A conceptual framework for apparel design that incorporates the FEA consumer needs model (Lamb & Kallal, 1992) was utilized to guide, clarify, and analyze the design production process. The procedure to develop the garments was based on six stages of the established framework, including problem identification, preliminary ideas, design refinement, prototype development, evaluation, and implementation. The nature of this design research was a problem-based practice called "product development" (Bye, 2010. p. 211). According to Bye: "In clothing and textiles research ... frameworks [such as] ... Lamb and Kallal (1992) have guided the development of the problem-based design research path" (2010, p. 214).

Process and Results

Applying FEA aspects to the designs resulted in the following. First, for the functional aspect, the garments are designed to perform the expected tasks for the target customer in terms

of fit, movement, donning and doffing. The princess style line, waistbands, and darts provide satisfactory fit; elastic in waistline, boxy top, bell sleeves, wide-leg pants, slits in bottom, and styles like A-line and oversized create comfort and ease of movement; snaps, zippers, buttons, suspenders, and hooks and eyes are used as closures, meeting the requirements for wearable finishes. Second, the garment represents value as a result of upcycling, and sustainability in the expressive aspect. Third, the garments satisfy the aesthetic demands for beauty and creativity via art elements such as asymmetrical balance, the denim's three-dimensional surface texture, shades of light and dark blue, bleaching, beads and studs, and the relationship between the body and the garment.

To create these upcycled designs, post-consumer men's blue jeans were collected from the men's section at a thrift store. Damaged or past life-cycle XL or XXL-sizes were chosen for two reasons: the need for wide swathes of fabric to apply the manipulation techniques to, and the need to reduce the amount of waste generated in deconstructing the jeans by using all four sides of every pair after taking out the pockets and the waistbands. The designer purposely used to visit the thrift store during the massive discount days to ensure buying unwanted pair of jeans that plus size consumers don't desire to purchase due to their low qualities. The waste leftover from all pairs of jeans used as props to decorate the window display during displaying the garments in department. And used to make accessories for the models during presenting the collection in the annual fashion show of the university.

The process of the collection development began with creating theme and style inspiration boards. Followed by sketching the initial designs using Adobe Illustrator and drafting the pattern. Next, developing the mock-ups for fitting adjustments and testing the accuracy of the surface designs. Then, applying the refinement process that views in three aspects: a) the modified ideas were represented in replacing many waist darts, integrating some design lines into garment pieces, adding more lengths or widths to clothing measurements, and eliminating darts for accommodating design; b) the rejected ideas showed in changing the based fabric of the design, using of separated pieces, ignoring closures; c) the selected ideas for further development showed in different examples such as yoke style that has adopted to add more weight in the coat neckline, weaving technique that has been chosen to improve the poncho design, and bleaching and re-coloring techniques that have been used to add dynamic motion to the design of shorts and top.

For the material perpetration and garment construction, all the pairs of used men's jeans have been deconstructed to be washed in hot water with detergent and dry properly for the goal of sterilization. After that, the denim material was cut based on the pattern pieces of each design. The techniques of fabric manipulation were applied on the denim surface before the pieces were sewn together. Every garment has its own special surface design technique for example, *North*



American smocking, gathering, laddering, fringing, stitching, tiding, patchwork, and weaving. Also, every garment has its own unique process of executing. Finally, the exhibition of the denim collection (Figure. 1) is considered an “expected outcome” of such problem- based design research (Bye, 2010, p. 214).

Figure 1. Exhibiting part of the denim collection

Conclusion and Contribution

This upcycled denim design project contributes to both academic and industrial understanding of sustainable fashion. It demonstrates that it is possible to achieve eco-friendly clothing by transforming used denim into new designs guided by a scientific framework. Since upcycling denim is not a very fresh idea, the designer adopted fabric manipulation as a novel and under examined approach. Thus, this practice provides an opportunity to explore new techniques of surface design and apply them to the used textile. However, even though the procedure of selecting used clothes has been done carefully to reduce the amount of the leftovers, plus some of the leftovers were used for props and accessories, there were bits of fabric, closures, seams, etc. that were not able to be used. For future implementation, the designer has suggested that engaging these potential leftovers in the production process to be part of the design will be a better solution for the sake of sustainability.

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