

Implementing a Design Process Framework for the Creation of Sustainable Wearable Art

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Introduction. Previous literature defines design as the actions that integrate several ideas, elements, and processes together cohesively for the purpose of achieving a design goal (Dorst & Cross, 2001; Mitcham & Holbrook, 2006 as cited in De Wet & Tselepis, 2020). Design goals help to guide the research process that lead to the creation of the design. The basic steps of this research process have been reported on by various authors and include the following: problem identification, idea generation, conceptualization of the design, and prototype creation (Aspelund, 2010; Ellinwood, 2007 as cited in De Wet & Tselepis, 2020). The design process framework (Jones, 2002) that was adapted to outline the creation process of sustainable and zero-waste designs (James, Roberts & Kuznia, 2016) was implemented as a guide within this sustainable design research (illustrated in Figure 1).

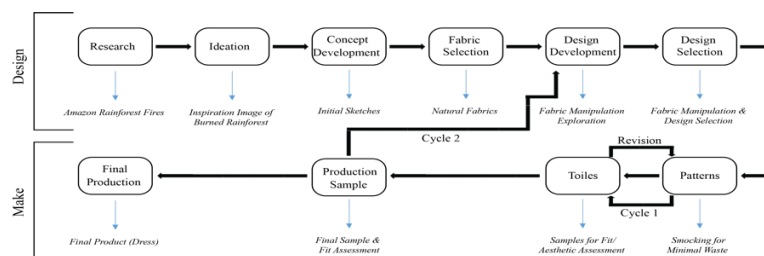


Figure 1. Design and make phases using zero waste design (James, Roberts, & Kuznia, 2016)

Implementation. *Design Phase:* According to Rampino (2011) as cited by De Wet & Tselepis (2020), the intention of a design goal can provide benefit to people, the environment, the industry, etc. The purpose of this design project was to create wearable art for sustainable environmental benefit using fabric manipulation techniques to achieve minimal waste. The goal of this design project was to create a statement as well as facilitate discussion pertaining to the environmental issue of climate change. At the time of initial ideation, climate change was a prominent topic in the news as well as on social media platforms. In July of 2020, the fires burning through the Amazon rainforest were 28% higher than in 2019 and the worst they had been since 2012 (Bowman, 2020). If the fires continue to occur at such alarming rates, in time the rainforest (currently one of the world's largest carbon sinks) will start releasing more carbon dioxide than it takes in and have a large impact on climate change (Bowman, 2020). The initial inspiration source for the concept of this design came from a photo discovered during the research process which highlighted the damage of the fires. The initial sketches (initial concept development) were created to portray a dual-sided effect showcasing the before and after effects of the destructive wildfires. Natural fiber fabrications were considered in the next step of the process, as it was imperative to

ensure a sustainable design approach throughout the entire design. However, more research needed to take place regarding the overall development of the design before a final fabric decision could be made. Various methods of fabric manipulation, including smocking, pleating, folding, and darting, were researched and experimented with to determine how to appropriately shape the garment to achieve the desired wearable art aesthetic while maintaining the concept of minimal waste. Upon experimentation, smocking was chosen as the preferred minimal waste method as it easily contours to the shape of the body while displaying clean patterns and shapes. With the major elements of the design in place, 100% cotton fabric was chosen as the last design decision because of its ability to maintain and hold its structure.

Make Phase: The pattern and sample creation of the smocked panels were the first steps in the make phase of the design framework. The initial pattern/sample (see figure 2) was cut 15” x 21” with a uniform smocked leaf pattern applied all over. When assessing the prototype, it was noted that the shape was correct for the design intention, however the fit did not contour appropriately to the body as the panel was too small through the bust and hips and too large through the waist. The first pattern revision was adjusted to a larger size to accommodate the bust and hips, and additional panels of smocking were included at the waist of the pattern to contour appropriately to the shape of the body. This revision displayed a correct fit, however the additional smocking panels appeared messy and did not compliment the original design motifs. The second pattern revision featured adjustments to the layout of the smocking pattern, however the pattern still appeared messy and did not contour appropriately to the body. At this point, it was noted that the larger smocking panels should be moved to the waist as they provided more contour. The third and final pattern revision reflected the necessary adjustments and portrayed clean patterns that also contoured correctly to the shape of the body. Once the final pattern was approved, it was implemented within the final production of the garment. The patterning and revision process of the framework are illustrated in figure 2.

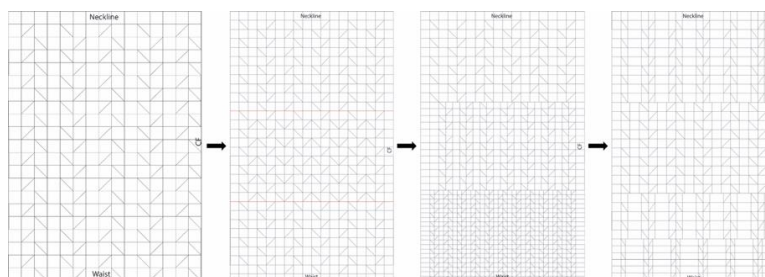


Figure 2. Pattern & revision process of the implemented framework

Conclusions. Contributions from this design research include: a) demonstrate the application of the sustainable design process framework in a wearable art design research; b) represent innovative minimal-waste patternmaking techniques utilizing smocked fabric manipulation in the creation of a sustainable wearable art.

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