
Using experimental patternmaking and digital technologies to design and create a self-help childrenswear ensemble

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Significance and research problem. There are a variety of experimental patternmaking techniques (e.g., Rissanen & McQuillan, 2016; Roberts, 2013; Sharma, n.d.). Typically, the avant-garde shapes created by these experimental patternmaking techniques are themselves the intended outcome. Rissanen and McQuillan's (2016) and Sharma's (n.d.) techniques also indicate that improved sustainability in their approaches to fabric use is a goal. There has been little research into the use of these techniques to create apparel in conjunction with other design techniques, for markets outside of adult apparel, or around a specific inspiration. To address this gap, a design study was initiated utilizing the concept of research through practice (Bye, 2010). This method is "initiated based on a problem or question that is derived from practice" with an artifact produced as the result (p. 214). This research sought to explore through practice what would happen when Sharma's (n.d.) planar flux experimental patternmaking technique was used to create a sustainable garment design, incorporating self-help childrenswear design principles, digital textile printing, and the Celtic selkie legend as inspiration.

Contextual review. The second phase of research through practice is a contextual review, which is similar to a literature review, but broader (Bye, 2010). In this instance, it included a survey of existing literature and the apparel market. *Planar flux* is an experimental patternmaking method that infuses the principles of the Mobius strip into flat pattern development. Departing from traditional notions of garment front and back patterns, Sharma's (n.d.) method typically begins with a geometric shape, which is then twisted as it forms around the body into a garment. Benefits of this technique are that it "creates volume while reducing fabric consumption" (p. 2). The reduced fabric consumption is more sustainable. *Self-help* childrenswear garments are those designed with features that permit a child to dress her/himself (Banerjee, 1964). Front opening garments with zipper closures are ideal for meeting this goal (Banerjee, 1964; Brown & Rice, 2014). Technology can be used in conjunction with experimental patternmaking techniques (Rissanen and McQuillan (2016). This research sought to answer the following questions:

1. Is planar flux a sustainable method for developing childrenswear garments, in terms of reduced fabric consumption?
2. Can the planar flux method be used to successfully create self-help childrenswear garments?
3. How does the planar flux method work in conjunction with digital printing?
4. Can the planar flux method be incorporated successfully with a specific inspiration—the Celtic selkie legend?

Design process. In line with the research through practice approach, the practice of the planar flux method was documented and periodic reflection occurred (Bye, 2010). Primary data forms that captured the process included sketches, quarter-, half-, and full-

scale prototypes. Sharma's (n.d., p. 7) "Within the Circle" concept of the planar flux method was used as the foundational design principle for a dress and coordinating shrug. One problem encountered in this practice was that the wrong side of the fabric would show. Digitally printed fabric has distinctive right and wrong sides. To resolve this issue, seams were added to the dress. The back dress piece had to be sewn with the correct side facing inward, resulting in the concealment of the wrong side of the fabric once the twisting step was implemented during construction. To incorporate the selkie inspiration, a fin-shaped tail was drafted as an addition to the front and back dress hem. The patterning of the shrug also required adaptations to the "Within the Circle" concept: (a) the shape of the shrug drafted as a horizontal ellipse, (b) selkie fin-shapes drafted on each end of the ellipse, (c) the elimination of the twisting method, shifting the proximity of the bodice placement within the ellipse, (d) a fin-shaped, partial sleeve was drafted, and (e) a center front opening was added. The final adaptations occurred in the construction process: the areas between the armholes were folded in half and sewn as side seams. Original prints were created for the digitally printed fabric. The complete garment ensemble serves as the evidence of the knowledge discovered during practice (Bye, 2010).

Analysis. In the final stage of the research through practice process, a critical analysis was undertaken in response to the research purpose (Bye, 2010). The ensemble used 4.5 yards of fabric. This is due to the patterns developed as large circles. The planar flux method was not successful in reducing fabric consumption for childrenswear. The researchers discovered the planar flux method significantly reduced the amount and time of labor to approximately one-third in comparison to past childrenswear projects. Therefore, planar flux is sustainable in that it reduces time for development, material waste, and labor costs. The design of the final ensemble permitted ease of donning and doffing without adult assistance. The researchers observed the child dress without help, which included zipping the dress herself. Adding extra seams to the planar flux method allowed it to be successfully combined with digital printing. The Celtic selkie legend was effectively incorporated into the planar flux pattern development through the addition of shaped pattern pieces. Future implications include considerations for the design and creation of experimental patternmaking methods in conjunction with other aesthetic and functional design components. Further implications concern apparel designers and the home sewing/patterning market allowing for more complex designs to be created for self-help childrenswear garments.

References

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