



Designing a Zero-Waste Pattern Cutting Project for Fashion Design Courses

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Key Words: sustainability, teaching, pattern making

Fashion design programs include foundational courses such as product development and pattern making. These early courses teach concepts that students will use continually as they develop their skills in garment design and construction. Concepts such as sustainability within the fashion industry have been increasingly added to fashion design and merchandising courses in recent years and have been explored by a number of studies (i.e. Fletcher & Williams, 2013; Gam & Banning, 2011). There are few studies, however, that have identified specific methods that have been used to effectively teach sustainability related in product development and pattern making courses. Literature about how zero-waste pattern cutting (ZWPC) has been implemented in these types of courses is exceptionally rare. The purpose of this study was to develop and evaluate class projects in which students applied the concept of ZWPC so they would be more aware of fabric waste generated during the design process. Ultimately, it was hypothesized students would be more likely to incorporate sustainable design principles into future work after having these initial experiences. The ZWPC project would also encourage students to make proactive decisions rather than passive decisions when creating sustainable designs.

Project based learning (PjBL) has been utilized as an active learning approach that encourage students to effectively learn new knowledge (Larmer, Mergendoller, & Boss, 2015). Designing a project is not a straightforward process; continual reflection should take place during the design and revision process. The project should be a tool for teaching content, while including a sustained inquiry process, the creation of a product, and an authentic connection to the real world (i.e. solving a real-world problem, meeting a design challenge, exploring an abstract question, conducting an investigation) (Larmer et al., 2015). Larmer et al. (2015) suggested the project design process include: (1) considering the context, (2) generating idea, and (3) building the framework.

Guided by the PjBL framework, ZWPC projects were developed for two courses, product development and pattern making. During the first stage of project development, the context of the problem to be addressed through the assignment was considered: the conventional pattern cutting process generates on average 15-20% of new fabric waste (Rissanen, 2013); employing ZWPC can significantly reduce the loss of fabric at the design stage. It was also noted at this stage that a ZWPC project can be a “creative patternmaking challenge by uniting the roles of designer and pattern making in a holistic approach to creating garments, considering aesthetics and function simultaneously (Carrico & Kim, p.58). This newer perspective on design will help students to develop creativity while considering sustainability. Ideas were generated in stage two of the project development, including the concept that ZWPC projects could be implemented into two existing courses. Product development was chosen because all students in the program take the course and because instructors wanted to evaluate feedback from students with beginning

sewing skills; pattern making was chosen because students were focused on design and had more advanced skills to apply creative concepts to designs. In the third stage of the project development, the framework was built by writing the actual assignments students would have to learn ZWPC. It was determined that the project should fit into two or three classes and should provide students the opportunity to use knowledge and skills that they learned in that class. Learning outcomes would be measured by course objectives.

Each project started with an introduction that addressed current problems in the fashion industry in terms of amount of waste generated. The concepts of pre-and post-consumer waste and fast fashion were introduced as justification for the project. Instructors selected a ZWPC pant for the product development course and a coat pattern for pattern making, both from Rissanen and McQuillan (2016). Each project was geared to the level of skills students had reached in each course.

Data was collected before and after the ZWPC project implementation in each course. Of the 39 students enrolled in the two courses, 33 students participated in the pre-survey and 25 students participated in the post-survey. Overall, students' consciousness about generating fabric waste while designing increased after the project completion ($t=-3.46$, $p<.01$). Student's opinions about the project were collected using questions based on a 5-point Likert scale. Students agreed that the project helped (1) to learn about sustainable design ($M=4.4$, $SD=.7$), (2) to learn about the concept of ZWPC ($M=4.3$, $SD=.8$), and (3) to become more aware of the different environmental issues on apparel production ($M=4.5$, $SD=.7$). However, students somewhat agreed that the project helped to enhance their creative design process ($M=3.8$, $SD=1.1$) that they would practice zero waste design in the future ($M=3.76$, $SD=1.2$), and that they would buy ($M=3.6$, $SD=.8$) or wear ($M=3.3$, $SD=1.3$) zero waste design.

Open-ended feedback on the project was also collected. Students said they liked the idea of zero waste design, its creativity and its unique silhouette, but they did not like in terms of fit and flexibility in creating different sizes. Students also indicated little choices in style variety and tailoring as limitations of ZWPC approach.

This study concluded that developing specific sustainability projects can be implemented in existing courses while inspiring students. The ZWPC approach is very different than conventional pattern cutting, thus the practice presents both challenges for students and learning opportunities.

References

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