



Incorporating High-Performance Cottons in Adaptive Clothing Design:

Blended Pedagogical Approach

May Chae

Montclair State University, USA

Keywords: high-performance, cotton, adaptive, clothing

Fabric selection is one of the most important decisions in clothing design. Factors such as season, locale, gender, and age group of the target population affect the selection (Uyesi, 2019). High-performance cottons are those in which

cotton's natural properties can be enhanced through application of new technology innovations that reinvent cotton as a true performance fiber. Through the use of Cotton Incorporated's branded technology solutions, cotton can be engineered to manage moisture as well as or better than many top-performing synthetics, or made to repel moisture with exceptional durability over the life of the garment. (Cotton Incorporated, n.d., para. 1)

In other words, these cottons are made with "a moisture-management process that enables effective wetness transfer away from the skin, eliminating dampness and chafing while maintaining the natural comfort aspects of the natural fiber" (Lifestyle monitor, n.d., para. 16). Faculty members teaching fashion design are responsible for creating a climate in their studio classroom that encourages students to learn practical skills and critical thinking, deal with creative challenges, and practice professionalism in pattern making and craftsmanship. That knowledge can help students think about new information and come up with a list of things that they will leave a comfort zone to see. The high-performance attributes of cottons convinced me to think about how these materials can be used to design something meaningful for people with special needs. Therefore, my purpose in conducting this research was to integrate the design process more effectively into a fashion design course through a semester-long cotton project. My *objectives* were three-fold: (a) familiarize students with the features and benefits of high-performance cotton fabrics (TransDRY®, STORM COTTON®, and TOUGH COTTON®) for adaptive clothing; (b) apply learned skills to real-life work; and (c) create prototypes using high-performance cottons that meet the requirements of adaptive clothing, as identified by interview participants in terms of function, expression, and aesthetics, and thereby improve wearers' quality of life. Under the unusual circumstances of the pandemic, I adopted a blended teaching modality that was better suited to the classroom than a 100% remote-teaching approach.

I employed the functional, expressive, and aesthetic (FEA) model of consumer needs (Lamb & Kallal, 1992) as an overall conceptual and curricular framework for designing adaptive clothing. According to Orzada and Kallal (2019), this model is a simple teaching tool to facilitate

the design, research, and evaluation phases. I used the FEA model to analyze responses regarding clothing needs and preferences of ten interview participants, consisting of five men and five women who ranged in age from their twenties to their sixties and had special needs such as spinal cord injury, multiple sclerosis, spina bifida, and club feet with premature arthritis in the ankle. Participants' functional needs included ease of donning and doffing, comfort, correct fit, durability, protective pockets, elbow protection (for men only), and appropriate materials for warmth or coolness. Expressive needs included feeling happy and confident and looking like everybody else. Aesthetic needs included attractive colors (neutral for men, colorful for women), appealing styles, and small patterns and embellishments.

I established the following student learning outcomes for this project: (1) use market and industry trend analysis in developing their designs with high-performance cottons, (2) integrate feedback and evaluations from peers and the professor during the design process, (3) apply flat pattern techniques to develop two prototypes (one for men and one for women) of adaptive clothing for people with special needs, and (4) present and obtain feedback from external reviewers. Through the learning activities of this semester-long project, students were able to use the design process to enhance their critical thinking and find ways to create adaptive clothing from high-performance cottons.

As the most important pedagogical format for this project during the ongoing pandemic, I adopted blended learning to enhance student learning, optimize active learning strategies, and improve student learning outcomes. Therefore, I divided 15 weeks into two parts. For the first half of the semester, the class met virtually to learn flat pattern techniques, present their preliminary design ideas, and revise them for the final project. For the second half of the semester, the class met face-to-face in small groups of three during different time blocks. They applied the practice skills learned in the first half of the semester to develop prototypes of adaptive clothing that would address identified needs. All completed prototypes were photographed for the virtual final presentation.

This project within the fashion design course assessed students' performance in terms of creative and critical thinking, practical skills, and craftsmanship through direct measures (the professor's observations of actual samples of student work) and indirect measures (peer feedback and external reviewers). I invited six external reviewers (a senior trend forecaster at Cotton Incorporated, a male interview participant, a female interview participant, two nursing professors, and a fashion professor) to evaluate each student's final product. The final presentation was held virtually. At the end, the external reviewers selected and announced the scholarship-award recipients for men's and women's adaptive clothing.

This project was a key part of the curriculum because it taught creative ways to design and make adaptive clothing, the most challenging aspect of which was choosing the right fabric. Fabrics for adaptive clothing are important for ensuring comfort, fit, flexibility, and match. Therefore, high-performance cotton fabrics (e.g., TransDRY®, STORM COTTON®, and

TOUGH COTTON®) with moisture-wicking properties are necessary to meet the needs of people with special needs. Two Nursing professors complimented students for thoughtful design of openings and for using storm cotton, which is moisture resistant and therefore helpful for people who drool or whose hands are unstable and extra pants pockets further down for special devices, such as for people with urination difficulties. A senior trend forecaster at Cotton Inc remarked that although adaptive apparel is a niche industry, “we all want kind of the same things and to be able to express ourselves in the same way” because everyone shares the same desire to be “happy, healthy, and safe.” She thanked the student for inspiring her and the other reviewers. . As a result, students expressed that the entire design process was essential to prepare them to recognize real-life applications of their future careers.

Funding for this project was provided by Cotton Incorporated.

References

Cotton Incorporated. (n.d.). *Performance Technologies*. <https://www.cottoninc.com/quality-products/fabric-technology/performance-technologies/>

Lamb, J., & Kallal, M. (1992). A conceptual framework for apparel design. *Clothing and Textiles Research Journal*, 10, 42-47.

Lifestyle monitor (n.d.). *Taking on the outdoors: Adapting performance technologies*.

<https://lifestylemonitor.cottoninc.com/taking-on-the-outdoors/>

Orzada, B., & Kallal, M. (2019). FEA consumer needs model: 25 years later. *Clothing and Textiles Research Journal*, 39(1), 24–38.

Uyesi, O. (2019). A research about relationship between fashion design and fabric parameters. *The Journal of Social Science*, 3(6), 511–516.