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## Scholarship of Teaching and Learning (SOTL) on Adaptive Apparel Design Projects in Higher Education: Analysis and Recommendations for Future Work

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Keywords: adaptive apparel, pedagogy, apparel design, SOTL

More than one billion people, around 15% of the world population have some form of disability and most persons at some time in their lives will experience disability be it temporary or permanent (World Health Organization, 2020). The limited adaptive clothing choices available to these individuals affect their ability to have an independent lifestyle (MacDonald et al., 1994). According to Vogue Business, the adaptive clothing market globally is estimated to grow to nearly \$400 billion by 2026 (Gaffney, 2019). In the US, apparel retailers and brands are launching brand extensions, creating independent brands, and offering adaptive apparel through e-commerce marketplaces to aid disabled individuals with apparel options (Weinswig & Schmidt, 2021).

Apparel designers need to be prepared for this emerging market, which requires unique knowledge and skill sets. There is a large range of disabilities that designers need to understand properly before designing adaptive apparel. Many disabilities result in non-traditional body types or require the individual to be in a seated position, such as wheelchair users (Gaffney, 2019). Cognitive disabilities may require an understanding of sensory apparel problems, such as scratchy fabrics, seams, or labels that need to be addressed. Currently, the adaptive clothing market is underserved in the apparel marketplace (Mallon, 2019).

Institutions of higher learning are in a unique position to address this emerging issue by developing effective teaching and learning approaches to prepare future apparel designers to design adaptive apparel. Through scholarship of teaching and learning (SoTL), educators can study teaching and learning and communicate their findings to build the body of knowledge of successful educational practices (Bishop-Clark & Dietz-Uhler, 2012). This communication enables other instructors to create enhanced learning environments, in this case, to prepare future apparel designers to design adaptive apparel. In this concept paper, the current SoTL of adaptive apparel design is examined and future applications are recommended.

### Analysis and Synthesis of Relevant Literature

Transformative learning “is the process of making change in a frame of reference” that is defined by “habits of mind and a point of view” (Mezirow, 1997, p. 5). This transformative experience may include making students aware of social constructions that have excluded users in the past and supporting consideration of these groups in the future, which is at the heart of teaching and learning adaptive apparel design. Integrating the critical theories of Disability Studies in the apparel design classroom can support transformative learning experiences. The field of Disability Studies “names the states of social oppression unique to people with disabilities while asserting at the same time the positive values they may contribute to society” (Siebers, 2008, p. 4). While there is little documentation of the use of this social model of disability promoted in Disability Studies in college-level clothing and textiles curricula, past studies in the design classroom (e.g. Gieben-Gamal & Matos, 2017) have documented transformative learning through this approach.

Problem-based learning (PBL) curriculum designs can be applied to teaching and learning adaptive apparel design. PBL “initiates students’ learning by creating a need to solve an authentic problem” (Hung et al., 2008). Benefits of PBL include enhanced problem-solving skills, higher-

order thinking, self-directed learning, interpersonal and professional skills, long-term retention of knowledge (Hung et al., 2008), and innovative thinking (Cao et al, 2006). Principles such as “anchor all learning activities to a larger task or problem..., support the learner in developing ownership for the overall problem or task..., [and] provide an opportunity for and support reflection on both the content learned and the learning process” embody PBL (Savery & Duffy, 1996, p. 3-6).

Textiles and apparel scholars have used PBL within various apparel design courses. For example, Gam and Banning (2011) utilized PBL in teaching designers about problem-solving in sustainable garment design and Cao et al. (2006) used PBL in teaching apparel design sustainability concepts. One PBL study was found that focused specifically on designing adaptive apparel. Min (2015) provided information on a teaching strategy to raise student apparel designer awareness of adaptive apparel through presentations from a non-profit organization supporting individuals with rare diseases. Based on the presented information, students developed design criteria, a mood board, illustrations, and technical drawings. Benefits of the project included students’ increased knowledge of designing for this specific population and interest in designing for underserved populations in the future.

Client-based is a specific type of PBL project that includes student interaction with a real (as opposed to theoretical) human-user (Burns, 1990). For apparel design students, a client-based PBL approach has been shown to increase efficacy in apparel construction, collaboration, self-efficacy, problem-solving, and communication (Eike et al., 2018). In a college industrial design course, McDonagh and Thomas (2010) found that a client-based project led to more empathetic designs for disabled users. In our literature review, one client-based, PBL, adaptive apparel design project for undergraduate designers was found. Hall and Lobo (2015) documented similar benefits: experience with new market categories, high student engagement, understanding social psychology in the design process, and a meaningful experience. In this course, students were paired with a child with disabilities. In addition to learning from the child and their caregiver, background knowledge was built through lectures, demonstrations, and field trips. Each student created a quality, commercial-ready garment ensemble that addressed the child’s clothing-related challenges and expressed the child’s personality.

The usefulness of PBL client-based apparel design projects to prepare students to design for the adaptive apparel market is clear. However, there is little published SoTL on the topic. Further, both SoTL studies of adaptive apparel design projects found in our literature review (Hall & Lobo, 2015; Min, 2015) are limited in the knowledge shared due to being two-page abstracts, thus limiting educators’ ability to implement such projects.

### Proposal for Future Action

Apparel design educators should incorporate PBL, client-based adaptive design projects from a disability studies perspective to create transformative learning. Further, they should incorporate a disability studies perspective (Siebers, 2008) to create transformative learning experiences (Mezirow, 1997). Educators should also document, study, evaluate, and communicate their work to build the body of knowledge (Bishop-Clark & Dietz-Uhler, 2012) of adaptive apparel teaching and learning practices. This will enable others to prepare students to address the apparel needs of persons with disabilities.

Apparel educators may be assisted in the development of such courses through collaborations with related organizations (e.g. occupational therapy, nursing, disability studies) as well as by inviting adaptive apparel users and their caregivers as guest speakers and/or clients. Further, engaging students with the adaptive apparel market (and its SoTL) should be expanded to all aspects of the apparel supply chain (e.g. illustration, marketing, and merchandising).

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