

Education for Sustainability: Development and Application of I3EADC Framework for Sustainable Apparel Design Curriculum

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Introduction. Sustainability issues have become an unprecedented “megatrend” (Mittelstaedt et. al., 2014) in the past several decades. In particular, apparel designers’ role in sustainable design has been emphasized in industry (Kozlowski, 2017), and designers and educators share unique burdens to contribute to the social responsibility of contemporary culture (Hawley, 2006). Educational institutions become major principle agents propagating the understanding of sustainability challenges (Cebrian, 2018; UNESCO 2005; United Nations 2012). However, research on sustainability in apparel design education typically has focused on specific project practices (e.g. Cao, et. al., 2014; Delong, et. al., 2016; Gam, et. al., 2009); there remains a lack of extensive attention on the theoretical to practical perspectives of effective teaching methods on sustainable design practices in apparel design courses.

Purpose and significance. The purpose of this study is to explore the utilization of an evidence-based model, *Inform, Engage, Empower, and Embed* (I3E) (Cebrian, 2018) to develop a sustainable apparel design educational framework for implementation in higher education. This research examines the effect of the proposed model (I3EADC) in apparel design courses from two different locations: Pacific Northwest and Midwest. The findings of this study benefit educators in the clothing and textile discipline to foster design students’ understanding and practices of sustainable apparel design. The results of the study also provide a practical guide for design students to follow as they work on student-led sustainable design projects and prepare these future designers to become ethical players in the apparel industry.

Theoretical underpinning: I3E model and sustainable apparel design. Instead of incorporating sustainable issues into design courses as a mere suggestion for students in projects, it is pertinent that educators stress the necessity of eco-friendly practices and have students consider sustainability a mandatory aspect of design, similar to how current corporations are contemplating the issue (Riel et. al., 2015). The I3E model (Cebrian, 2018) was created to support interactive educational practices in higher education and sought to redesign educational design and delivery in three ways: authoring, teaching, and learning. The goal of this project was to contribute to holistic, as well as structural, transformation of classes in higher education to integrate sustainable thought. With this, the four components of the I3E model (Cebrian, 2018) were determined as a framework for apparel design curriculum development.

Method and application of I3E model. The I3E model was applied to two different design studios, a senior-level advanced design studio and a junior-level patternmaking and design studio. For the *Inform* stage, the instructors introduced the students to the concept of sustainability by showing the video “The True Cost,” a documentary praised by critics as an eye-opening story that scrutinizes issues in the fashion industry (Gustafson, 2015): students also reviewed selected case studies and current news articles. In the *Engage* stage, students were assigned to develop garments using sustainable design process; the instructors first shared a holistic sustainable design process model that included a design brief, material selection, pattern development, and technology application including pattern digitizing, laser cutting/etching, and construction. Past student design examples with sustainable practices were also shared with the students. For the *Empower* stage, students’ designs were peer-evaluated in the class and critiqued by the instructors and industry professionals. The students from both classes joined the critique sessions through a virtual conference to review how students from another institution executed their works. Based on the accumulated evaluations, some of the students’ designs were submitted to juried design exhibitions for dissemination. In the *Empower* stage, an online survey was administered to assess student learning experience and, based on the results and in-class observations by the instructors, new learning modules were developed in the *Embed* stage, wherein researchers embedded the research findings into their existing research projects. The data retrieved during the *Empower* stage were analyzed through a mixed-methods approach; the qualitative data were analyzed by the identification of categories and themes using the constant comparison method, and a descriptive analysis was conducted for the quantitative data. The research variables included perceived usefulness, perceived ease of use, perceived enjoyment, perceived improvement in learning, and motivation towards practicing sustainable apparel design. Each research item was retrieved from previous studies on a seven-point Likert-type scale.

Results & Discussions. A total of 61 design students participated in the study and completed the online survey. A majority of the students were female (N=53) and about half of the students were seniors (N=32) and juniors (N=29). Approximately 60% of the students were White, followed by African American (11.5%), Hispanic (9.8%), Asian (8.2%), and other (8.2%). The students indicated that their understanding of social responsibility in apparel design increased as a result of the first three stages of the model (M=5.78; SD=1.12), were motivated to do sustainable apparel design (M=5.91; SD=1.12), and that the framework was helpful in enhancing their design processes (M=5.88; SD=1.40). The qualitative data revealed that using the framework enhanced their ability to design, from concept to execution, and allowed them to “fully plan out exactly how to execute ideas that were envisioned” [P9]. Especially, students indicated that they gained “new insights on material selection process related to sustainable apparel design” [P37] and “combined both logical and creative strategies” [P6]. Students remarked that the most effective parts were the overview of the step-by-step process, student examples, the documentary from the *Inform* and *Engage* stages, and critiques and discussions with students from another institutions in the *Empower* stage, because they “motivated” [P53] students to practice sustainable designs in the future.

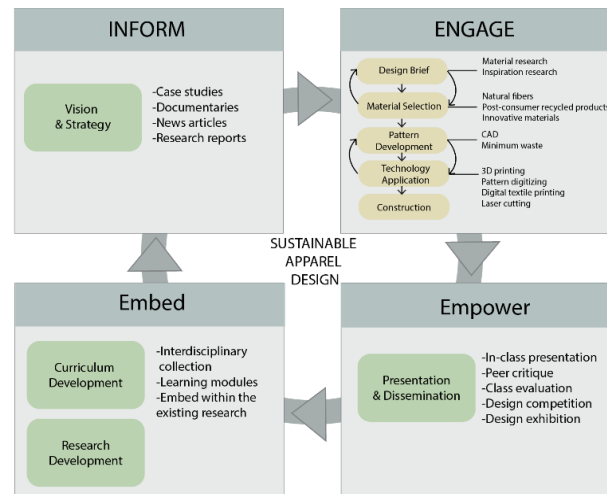


Figure 1. Proposed I3EADC framework

The research findings contribute to the effectiveness of the proposed sustainable design process framework of I3E Apparel Design Curriculum (I3EADC) model. The results of the study have implications for educational professionals, particularly in the context of teaching social responsibility and the sustainable apparel design process. This presentation includes discussions of in-depth processes involve in the four stages of the model, the use of an upcycling design project, assessments of student learning, and embedding of modules and future research development.

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