Development and Implementation of a Cross-Course Collaborative Project on Cotton Sustainability: A Self-Determination Theory Perspective

Sarah West Hixson, University of Arkansas
Eunjoo Cho, University of Arkansas
Kyuree Kim, Oklahoma State University
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Introduction: Sustainability is swiftly rising as a core competency needed for graduates from textiles and apparel (TA) programs (Bringé, 2023; Wong & Ngai, 2021). Incorporation of sustainability education is essential for TA students to prepare them with fashion industry knowledge and skills (Abbate et al., 2024). Self-determination theory (SDT) emphasizes the importance of providing students (i.e., TA students) with content (i.e., sustainability education) that resonates with their interests and aspirations in both subject matter (i.e., fashion) and industry trends (Ryan & Deci, 2000). Particularly, cotton sustainability has an extensive socio-economic impact on a global scale, affecting water, soil, and labor sectors; it also aligns closely with fashion as a textile industry product, impacting TA at each level of the supply chain (Moazzem et al., 2022).

Given the importance of sustainability education, a cross-course collaboration project centered on cotton sustainability has been developed and implemented within a TA program to address the need for further efforts to educate TA students about environmental and social sustainability associated with TA products (Han, 2019). The collaboration spanned sophomore, junior, and senior courses. The collaborative project is designed to support students' basic psychological needs (Ryan & Deci, 2000; SBPN) while increasing their motivation to engage with cotton sustainability. The objectives of this project were: (1) to offer students a scaffolded, cross-course activities that provide insight and experience with industry-inspired competition and collaboration in a low-stakes environment (Nwokeji & Frezza, 2017) and (2) to examine the effect of SBPN fulfillment on attitudes towards sustainability.

Theoretical Background: SDT provides a framework to assess the effectiveness of the collaborative project in fostering meaningful engagement among participants in both education and sustainability. SDT describes the processes behind individuals' motivational propensities for psychological growth and integration (Deci & Ryan, 2000). SBPN fulfillment plays an important role in enhancing intrinsic motivation and internalization, resulting in high-quality motivation, academic achievement, and psychological well-being (Ryan & Deci, 2020). SBPN needs (i.e., autonomy, competence, and relatedness) can be fulfilled in a classroom setting by providing choices and ownership, supporting students' sense of capability, and developing students' sense of belonging and connection (Zhao et al., 2021). Collaboration has a significant, positive impact on fulfilling each SBPN (Visser et al., 2019). Furthermore, cross-course collaboration increases student motivation by fulfilling SBPN and enhancing students' understanding and application of industry-based concepts (Pazos et al., 2019).

Methodology: Three courses across a TA program at a major Mid-southern university were selected for their content congruity. A senior-level merchandising class creates retail business proposals in small groups to share them with two lower-level classes, simulating entrepreneurship experiences. A junior-level brand management class creates social media marketing ads after selecting a senior-level business to work within a 1:1 ratio, simulating

industry competition for resources. A sophomore-level computer-based design class with a focus on Adobe products for trend forecasting and technical flats generates mood boards and design boards in a 1:2 ratio, allowing choice among the senior-level groups and simulating industry competition. Students are more likely to be autonomously motivated to learn when educators provide choice and position topics (i.e., sustainability) as a context to engage with rather than the required study topic (Benita et al., 2023).

After informed consent for the mixed methods study and project procedures explanations in each course, an online survey was distributed to students. Open-ended questions prompted students to discuss their perceptions of the project and sustainability. Close-ended rating scale questions measured students' autonomy, competence, and relatedness, and attitudes toward sustainability (ex. its importance in the cotton industry). Descriptive statistics, confirmatory factor analysis, ANOVA, and multiple regression analysis were conducted in SPSS 27.0 to examine the relationships between the three SBPN constructs and attitudes toward cotton sustainability.

Results and Discussion: Across the three courses, 115 students participated. Students reported an average of 5.5 for attitudes towards cotton sustainability, 5.16 for autonomy, 5.07 for competence, and 4.73 for relatedness on a 7-point scale. Regression results showed that autonomy ($\beta = .27$, $p < .01$) and competence ($\beta = .25$, $p < .05$) significantly predicted student attitudes towards cotton sustainability, whereas relatedness did not have a significant effect. Relatedness score changes are expected post-project completion. Additionally, ANOVA results confirmed that attitudes did not significantly vary across the courses, $F(2, 113) = 2.73$, $p = .07$. This demonstrates the unified impact of the project design across three unique course objective sets and instructors. Qualitative data, summarized and thematically coded (Saldaña, 2013), revealed that 46% of students reported little or no environmental and/or cotton sustainability knowledge, but medium to strong interest in learning about it. The senior students showed strong interest in sustainable business creation and understanding of manufacturing, while junior students prioritized learning about cotton sustainability specifically. In contrast, sophomore students discussed a desire for creative expression and a broader interest in cotton and general sustainability topics. These results mirror the relevant course objectives for each course.

Conclusion: This cross-course collaborative project demonstrates the impact of intentional design and SDT-centered practices in an industry-based TA curriculum on student engagement with cotton sustainability. Results indicate a positive association between SDT-centered approaches to learning and sustainability engagement, highlighting the importance of integrating sustainability education in a context that resonates with students' interests and aspirations. Moreover, qualitative findings reveal that students across different course levels prioritize various aspects of sustainability, aligning with their respective course objectives and illustrating the relevance of tailored educational approaches in addressing diverse learning needs. This study is part of a continuing study on broader experiences within the course, cotton sustainability knowledge and purchasing intentions. Thus, future research will examine how these dimensions relate to the components of this pedagogical study. Funding for the project was provided through a competitive curriculum grant from Cotton Incorporated.

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