

A Case Study in Sustainability and Fashion Education: Adventures on the Green

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Abstract: The purpose of this qualitative case study was to examine the perceived impact of a fashion course that was reframed for sustainability using the education for sustainable development (ESD) framework. Specifically, the study explores the holistic integration of sustainability in a curriculum focused on the making and marketing of material products, a seemingly counterintuitive context. Data collection included student reflective writings, focus group interviews, and a reflexive research journal kept by the researcher. ESD manifested in the student experience to the greatest degree in learning and development outcomes related to sustainability literacy and working with others. Interestingly, outcomes related to sustainability literacy were overshadowed by a substantial leap in collaborative and cooperative capacity, according to students. Notably, this case demonstrates that when sustainability is approached as a creative exercise, students take little issue with the new paradigm. This study also demonstrates how skills associated with ESD may be integrated into a course without sacrifice of course content, significantly enhancing the learning and development experience. The outcomes experienced by learners and the role ESD played in these outcomes provides important context for the integration of sustainability in a field of study preoccupied with the bottom line.

Keywords: apparel, sustainability, case study, student learning, curriculum redevelopment, sustainable development

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Higher education's mimicry of the unsustainable economic system in which it resides is one the most arduous barriers to integrating sustainability across all disciplines (Haigh, 2008; Orr, 2004). Although no discipline is exempt from this infrastructure, fields of study affiliated with the making and marketing of products and services embody a unique set of dilemmas. The business school acknowledges that the historic emphasis on profit maximization in management and marketing curricula complicates the integration of sustainability (MacVaugh & Norton, 2012; Marshall & Harry, 2005; Maxfield, 2011; Stubbs & Cocklin, 2008). MacVaugh & Norton (2012) add that this challenge is compounded by the fact that students often self-select such programs for the explicit purpose of one day leading economic growth themselves, and sustainability seems counter to this goal (Benn & Dunphy, 2009). A similar challenge is shared by fashion education, but is perhaps exacerbated by the relationship between profit maximization and the superfluous consumption of a material product. Consequently, integration of sustainability into fashion education, like business education (Rundle-Thiele & Wymer, 2010; Fisher & Bonn, 2011), has been challenging.

Fashion and other business industry sectors are undoubtedly in a greening phase, as indicated by the implementation of retrofits, material substitutions, and green marketing messages; nevertheless, they are carefully circling, but not addressing, the production-consumption conundrum. Most curriculum efforts related to these fields have simply followed suit, adding topics of sustainability sporadically in the curriculum without necessitating an epistemological shift. Some authors in these fields urge a transition from greening to a more holistic and transformational application of sustainability and sustainable development in the curriculum (Armstrong & LeHew, 2011; Bridges & Wilhelm, 2008; Pasrichia, 2010; MacVaugh & Norton, 2012; Walck, 2009).

Education for sustainable development (ESD) calls for a new paradigm, a reorientation of education (McKeown, 2006). This reorientation includes a dramatic reconceptualization of *how* students should learn, *what* should be learned as well as how proficiency should be defined and assessed. It is a holistic approach to education emphasizing the interrelationship between social, economic, environmental, political, and cultural components, and ultimately, a shift in what we deem valuable in education (Haigh, 2005; UNESCO, 2005). In this light, education's purpose is to prepare citizens and stewards with knowledge, skills, and values that promote sustainable behavior and encourage learners to foster a relationship with and participate in their local and global community (Egan, 2004) as well as prepare for viable employment (UNESCO, 2005). Specifically, this model of education is designed to transform the current industrial archetype and its consumptive demands, preparing learners to lead that transformation.

Some studies have explored the application of ESD in management or marketing programs using a variety of approaches, including multiple perspectives (Stubbs & Cocklin, 2008), active learning (MacVaugh & Norton, 2012), discipline-specific frameworks such as quality management to stimulate critical thinking about sustainability (Rusinko, 2005), and whole-person learning (Mabry, 2011). Others have worked to alter content across the curriculum, some focusing on the development of skills for sustainability (Pesonen, 2003; Benn & Dunphy, 2009). Borin & Metcalf (2010) developed a comprehensive list of class activities designed to develop skills among marketing students that include environmental and social dimensions. But many of these studies have been conducted in MBA programs, rather than at the undergraduate level

(Stubbs & Cocklin, 2008; Benn & Dunphy, 2009; Maxfield, 2011) and have yielded little empirical data about how students perceive and respond to this shift in curricular purpose. Most recently, MacVaugh and Norton (2012) argued that more research is needed to better understand how students in this context *experience* these alternative approaches.

The purpose of this study was to examine the perceived impact of a fashion course that was holistically reframed for sustainability using the ESD framework. This qualitative case study tells the story of an adventure embarked upon by a small group of students enrolled in an apparel product development course. The redeveloped course included a transformation in content as well as the integration of key skills that have been associated with ESD. The case provides a rich description of how the holistic application of ESD in a course affects the student experience and the ways in which ESD enhances that experience.

The ESD Framework

A literature review was conducted to identify the key constructs of ESD, which we used to redevelop the apparel product development course implemented in the study (see Armstrong & LeHew, 2011 for a completed description of the course redevelopment process). Table 1 lists and defines the key constructs utilized in the new course.

Table 1 <i>The Education for Sustainable Development (ESD) Framework</i>	
ESD constructs	Definition
Reframing content	Purpose of course content reframed to sustainability and sustainable development (Jucker, 2002; McKeown, 2006; Svanström, Magdalena, Lozano-Garcia, & Rowe, 2008), removing unsustainable root metaphors such as unlimited growth and scale (Bowers, 2001).
Sustainability literacy	Understanding sustainability, its implications, and the need for change, including knowledge and skills needed to empower individuals to make change and move others to make change (Forum for the Future, 2004; Murray & Murray, 2007).
Multiple perspectives	Interrelationship between social, environmental, and economic perspectives on local and global levels embedded in subject matter (Filho, Manolas, & Pace, 29; Stables & Scott, 22).
Discipline-ecosystem connection	Illustrated relationship between field and ecosystem (Rode & Michelsen, 2008; Stables & Scott, 2002).
Reality modeling	Educational experience mimics real life (Forum for the Future, 2004; Hopkinson, Hughes, & Layer, 2008); learning is personal and supports practical action supportive of sustainability (Filho <i>et al.</i> , 2009; Rode & Michelsen, 2008; Svanström <i>et al.</i> , 2008).
Problems-based	Focus on problem solving over information dissemination (Bosselmann, 21).

Table 1 (continued)

The Education for Sustainable Development (ESD) Framework

Educators as partner	Educators are facilitators, collaborators, and fellow learners on sustainability journey, embodying new paradigm and practicing what they preach (Wals & Jickling, 2002; Welsh & Murray, 2003).
Change agent skills: Working with others	The development of civic capacity; ability to work with others <i>collaboratively and cooperatively</i> (Dale & Newman, 2005; McKeown, 2006; Svanström <i>et al.</i> , 2008). Leadership is democratic and shared (Egan, 2004; Haigh, 2008; Sipos, Battisi, & Grimm, 2008), and learners develop capacity to lead and follow (ACPA, 2008; Dale & Newman, 2005). Underpinning the learner's ability to collaborate and cooperate is their ability to <i>communicate effectively</i> (McKeown, 2006; Svanström <i>et al.</i> , 2008), which involves both meaningful listening and expression, emphasizing democratic dialogue (Colluci-Gray, Camino, Barbiero, & Gray, 2006; Landorf, Doscher, & Rocco, 2008). Learners <i>resolve conflict</i> effectively (ACPA, 2008; Egan, 2004; Filho <i>et al.</i> , 2009), anticipating, acknowledging, and accepting conflict's role in human relationships. Learner develops capacity to resolve conflict in an equitable, mutually beneficial way (ACPA, 2008; Colluci-Gray <i>et al.</i> , 2006).
Change agent skills: Critical thinking	Capacity for <i>systems thinking</i> (McKeown, 2006; Filho <i>et al.</i> , 2009), identifying and exploring multiple perspectives; chiefly, social, environmental, and economic perspectives concurrently (Colluci-Gray <i>et al.</i> , 2006; Forum for the Future, 2004; Sipos <i>et al.</i> , 2008; Svanström <i>et al.</i> , 2008). Capacity for <i>values-focused thinking</i> , using shared personal values to imagine sustainable solutions (Keeney, 1992; Sipos <i>et al.</i> , 2008). The articulation of personal values by the learner is imperative (Dale & Newman, 2005; Warburton, 2003). Learner articulates personal values to others, but also appreciates and finds legitimacy in those of others; identifying shared the values used in decision-making to imagine new solutions (Keeney, 1992). Capacity for <i>reflection</i> on experience, with improved action in mind (Forum for the Future, 2004; Schlottman 2008).
Authentic assessment	Beyond measurement of knowledge to measurement of skills, perceptions, behaviors, and values. Methods allow for authentic responses as opposed to one correct answer (Rode & Michelsen, 2008; UNESCO, 2005).

Because pedagogy associated with ESD is evolving, we chose to ground the current study in a specific pedagogical approach. Many pedagogical theories have been associated with ESD, most of which are indicative of a constructivist epistemology characterized by high levels of learner engagement (active, applied, problem-based, inquiry-based, service and experiential learning), social interaction (interdisciplinary, multidisciplinary, and participatory learning), and a metamorphosis of the learner's beliefs (deep and transformational learning, emancipator and critical pedagogy). Constructivism extends cognitive learning theories, including contextual issues, such as social interaction and previous experience, in the construction of knowledge. It is predicated on the presumption of "situated cognition," the idea that knowledge does not reside only in the mind, but is situated in the context of individuals' past experiences, beliefs, and values, cognitive processes, and environments (Schunk, 2008). Therefore, learning is not uniform, but unique to each individual. The core assumption of constructivism is that the learner creates his or her own knowledge rather than acquiring it (Fox, 2001; Schunk, 2008).

Perspectives on constructivism are many and differ primarily in the timing and amount of assistance given to the learner and the type of knowledge that is constructed. Moshman (1982) presents three perspectives: Exogenous, endogenous, and dialectical. He describes these three positions in terms of a root metaphor, pointing to where the knowledge is constructed: Organism (endogenous, or an internal construction), mechanism (exogenous, or an external construction), and contextual (dialectical, or an interaction between the organism and mechanism). An endogenous perspective focuses on cognitive development or what happens internally. An exogenous perspective emphasizes the environment's role in learning or a preoccupation with behavior. A dialectical perspective, on the other hand, is perched between these two, evidencing a highly interactive, reciprocal interaction and reflection that yields learning (Vygotsky, 1978). The latter perspective best aligns with the pedagogical proclivities of ESD. Therefore, this approach was highly influential in the redevelopment and implementation of the new course.

Methods

The primary objective of this study was to examine the learning and development experience of students enrolled in a fashion course that has been redeveloped using the ESD framework. The study provides a rich description of the student experience and explores ESD's role in that experience. For the purpose of this study, learning is defined as knowledge gained in the educational experience while development is considered the increased capacity for application of skills. We posed one central research question and several sub-questions to guide inquiry in the study:

- How do students experience a course that embodies the ESD framework?
 1. What learning and development outcomes do students experience during the course implementation?
 2. What aspects of the course appear to have the greatest impact on learning and development outcomes?
 3. How do students compare this course experience to others in their program?

A qualitative case study was conducted. Eisner (1998) advocates for the use of qualitative inquiry in education, because studying what happens in a classroom and all its idiosyncrasies is most useful to practitioners. Case studies are used primarily to generate a deep description and understanding of a real-life situation as perceived by those who are involved (Merriam, 1998; Stake, 1995; Yin, 1989) and are especially useful in offering insight about an area of education that has received little research, such as an innovative program or practice (Merriam, 1998) like ESD. Yin (1989) argued that single-case studies are ideal when the characteristics of the case are rare and thus represent an extreme or unique situation. Because the course in the current study was redeveloped according to ESD and implemented to study responses to this special situation, this justification seemed appropriate.

Setting and participants

The study was conducted in a fashion program at a large Midwestern land grant university. The sample included 14 undergraduate seniors, 3 fashion design and 11 fashion marketing students. Seniors were considered a particularly attractive sample because they were in the best position to compare their experience in the redeveloped course to other courses in their program. The

apparel product development course was chosen for redevelopment, as it is a senior-level capstone experience and program requirement. The capstone course was also ideal for emphasizing collaboration. The course focus was also ripe for redevelopment in light of environmental and social industry issues that span the product development cycle from materials selection to consumer use to disposal. We used a theoretical model to redevelop the course, ensuring consistency with the ESD framework (Armstrong & LeHew, 2011). Enrollment was limited to increase the researchers' ability to observe and interact with participants.

During the course, students worked in groups to prepare a sustainable apparel product development proposal, which unfolded through a series of assignments, including a consumer profile, a market survey, an inspiration board, design concept boards and brief, a marketing dossier, and a product specification package. A key concept in the course was future-proofing, in which students used potential future scenarios from *Fashion Futures 2025*, a report by Forum for the Future (Bennie, Gazibara, and Murray, 2010), to guide their conceptual process. The report offered hypothetical scenarios based on key variables such as climate change and the decreasing availability and escalating cost of natural resources. Students role-played a hypothetical industry scenario in which a sustainable apparel marketer, Green Sweat, Inc., had gone bankrupt after attempting to enter the market using a sustainable strategic platform. The company for which the students were hypothetically "employed" requested their assistance to set the brand on a new, more sustainable path. Members of student groups carried management titles such as marketing director, merchandise coordinator, head designer, and director of sustainability, and were expected to play these roles during the completion of the course assignments. Likewise, the instructor (the researcher) played the role of Director of Product Development and acted as advisor, facilitator, and collaborator on course assignments.

Skills associated with ESD were integrated into the course design, including cooperation and collaboration, effective communication, conflict resolution, systems thinking, values-focused thinking, and reflection. "Company training" was conducted early in the course, presented as fundamental preparation for collaborative teams working through sustainability-related challenges. Students also learned about and applied a number of sustainable design paradigms to their work, such as biomimicry and industrial ecology, design for well-being and activism, design for environment, and cradle-to-cradle. The major learning outcomes targeted in the course included understanding the technical as well as conceptual process of apparel product development, the application of sustainable design paradigms to apparel, and the demonstration of collaborative and critical thinking skills supportive of sustainable development.

Data collection

Several types of qualitative data were collected to obtain an understanding of the students' course experience: Student reflections, focus group interviews, and a reflexive journal kept by the researcher (the instructor). Student reflections are considered to not only enhance the learning process, but also provide a valuable evaluation tool about how students experience their learning environment (Kuznic & Finley, 1993; MacGregor, 1993). A reflection template was developed for students and was collected twice during the semester, once at mid-term and once during finals week. Students responded to four questions:

1. What have been the major learning epiphanies or outcomes you have experienced in this course so far?

2. What were the most important ingredients contributing to these epiphanies or outcomes?
3. In terms of the collaborative and thinking skills included in the course, what has been the most important developmental progress you have made so far?
4. What were the most important ingredients contributing to this progress?

Focus group interviews were held in the latter weeks of the course, for which a \$20 financial incentive was offered. Ten of the fourteen students enrolled in the course volunteered to participate. Because the researcher was the instructor, an outside moderator familiar with the study's priorities and theoretical underpinnings conducted the interviews (Vaughn, Schumm, & Sinagub, 1996). A semi-structured interview protocol was developed using a series of "grand tour" questions including key prompts to be used by the moderator. Two focus groups were conducted, each in approximately 1.5 hours. The interviews were digitally recorded and transcribed by a third party. Consent was requested at the beginning of the interviews in addition to a confidentiality agreement, recommended by Berg (2001), restricting public disclosure of participant identities and their comments. During transcription, numbers replaced participant names, and transcripts were not delivered to the researcher until after final course grades were submitted.

The literature advocates use of reflection in both research and teaching (Hatton & Smith, 1995; Stake, 1995), for which reflexivity, reflection about reflection, is emphasized (Alvesson & Sköldberg, 2009; Etherington, 2004). Etherington (2004) submits that journal writing can be used as a qualitative research technique and considered an additional set of data used to document the history of the study as well as help researchers better understand their own conceptual process. In the current study, the researcher maintained a reflexive journal throughout the study, beginning when the course commenced and ending upon the completion of data analysis. A journal template was used to 1) document what the researcher was *doing* in the classroom and what was happening among participants as a consequence, and 2) to describe the researcher's conceptual process in the systematic exploration of interpretations. The researcher completed a journal following each class period during both sections of the course, which consumed approximately 1.5 to 3 hours twice per week.

Data analysis

Both theory-driven and inductive coding was used during analysis. Both Yin (1989) and Stake (1995) suggest using theory-driven codes to categorize data first. Accordingly, the researcher began with a cursory read, and then began to categorize data according to research question. Next, the researcher began with the theoretical underpinnings of the study, a comprehensive laundry list of broad constructs related to ESD, and created a rubric with the code names, definitions, and rules for application. The researcher applied these codes to the data, then began to identify themes falling outside the theory-drive codes to develop inductive codes.

A peer debriefer who was unattached to the outcomes of the study was utilized throughout the data collection and analysis process (Creswell, 2007). The researcher and the peer debriefer met frequently, completing an iterative process of randomly selecting portions of the data and applying the preliminary codes to the data both independently and together until the best fit was achieved. This process revealed instances in which the researcher's role as the instructor colored

her interpretations. Finally, after the major themes of the study were identified and validated by the peer debriefer, the researcher reviewed her own 30 reflexive journal entries completed during the course and extracted relevant excerpts correlated with the study's findings.

Results

The following is a portrayal of the student experience in the new course. The study's themes are organized by the study's research questions. Tables are provided to illustrate support by participant and data type. In some instances, observations taken from the researcher's reflexive journal are noted. Additionally, themes listed in each table are coded with superscript annotations, designating their origin and meaning: Theory-driven theme ^(T), Inductive theme ^(I), themes related to learning ^(L), and themes related to skills development ^(D). An annotation is also given to indicate if the participant discussed the theme in the first or second reflection (R1), (R2), the first or second focus group interview (I1, I2), or the researcher's reflexive journal (RRJ).

What are the learning and development outcomes experienced by students during the course implementation?

Table 2 provides a summary of the study's themes related to outcomes experienced by students enrolled in the course. A popular learning outcome was sustainability literacy, an explicit goal of ESD. Participants discussed four inductive themes, describing a dramatic leap in their knowledge and awareness about sustainability as well as strategies that may be used to implement such a paradigm. Admittedly, they had come to the course with little or no background, as observed by the researcher (RRJ 1). Many participants commented that this was the first time in their program that the concept had been defined holistically, including a broad view of all three tenets (social, environmental, and economic) and a connection made to their discipline in real terms:

P014: In no other class had we learned so much about all the different aspects of social and environmental responsibility... Learning all the different aspects to product development and how sustainability can and should play such a huge part in it was very significant and led me to change my views not only on the fashion industry, but also where I might see myself in coming years. No other class did we go in to such depth in the issue, so what I learned helped me understand it better. (R2)

Table 2
Learning and Development Outcomes

Themes	Reflection 1	Reflection 2	Focus groups
(I)(L) Sustainability knowledge and awareness	P2 P4 P7 P010 P011 P012 P013	P2 P3 P4 P5 P7 P8 P010 P011 P013 P014	P2_I1 P1_I1 P2_I2 P1_I2 P2_I2
(I)(L) Recognizing importance and need for change	P2 P5 P7 P8 P011 P012	P2 P3 P4 P5 P7 P010 P014	P7_I1 P2_I1 P5_I1 P4_I1 P1_I2 P3_I2 P2_I2
(I)(L) Sustainable strategies	P2 P4 P5 P6 P8 P9 P010 P011 P012	P2 P4 P5 P8 P010	P4_I1 P5_I1 P2_I2 P1_I2
(I)(L) Time does not heal all wounds	P4 P5 P6 P012 P014	P4 P6 P012 P014	P2_I2
(I)(L) Good communication fosters inclusion	P1 P2 P3 P4 P5 P7 P8 P9 P010 P012 P013 P014	P2 P3 P4 P5 P8 P010 P012 P014	Not mentioned
(I)(L) Awareness of personal behavior	P3 P4 P5 P6 P7 P8 P012 P013	P1 P3 P5 P6 P8 P9 P012 P014	P4_I1 P2_I2 P3_I2
(I)(L) I am not an island	P1 P4 P8 P010 P011 P014	P1 P4 P5 P6 P9 P010 P012 P014	P2_I2
(T)(D) Ability for personal expression	P1 P3 P4 P5 P8 P9 P010 P011 P012 P013 P014	P2 P3 P4 P5 P6 P7 P8 P010 P011 P012 P013	P1_I1 P5_I1 P7_I1 P4_I1 P6_I1 P2_I2 P1_I2
(T)(D) Ability to listen without judgment	P1 P2 P5 P6 P8 P9 P010 P011 P013	P2 P5 P6 P8 P9 P013	P4_I1 P3_I2
(I)(D) Ability to build ideas	P1 P3 P4 P5 P6 P7 P8 P010 P011 P012 P013 P014	P1 P7 P8 P9 P010 P012 P013	P4_I1 P1_I1 P2_I2 P3_I2
(T)(D) Ability to collaborate democratically	P1 P2 P4 P6 P7 P8 P011 P012	P1 P2 P4 P5 P6 P7 P8 P9 P012 P013 P014	P6_I1 P3_I1 P2_I1 P5_I1 P1_I1 P2_I2 P1_I2 P3_I2
(I)(D) Ability to be all in	P1 P5 P7 P8 P9 P010 P011 P014	P1 P2 P3 P4 P5 P6 P7 P8 P011 P012 P014	P3_I2
(T)(D) Ability to acknowledge and resolve conflict	P1 P2 P5 P011 P012 P013	P1 P3 P4 P5 P6 P010 P011 P012 P013 P014	P2_I2 P1_I2
(T)(D) Ability to reflect	P5 P012	P6 P012	P4_I1 P7_I1 P2_I1 P3_I1 P6_I1 P2_I2 P3_I2
(I)(D) Ability to think creatively and imaginatively	P2 P3 P4 P6 P8	P2 P3 P7 P011	P3_I2 P2_I2
(T)(L,D) Transfer	P1 P2 P3 P5 P7 P9 P011 P014	P1 P3 P4 P5 P6 P7 P010 P011 P012 P013 P014	P3_I1 P1_I1 P2_I1 P4_I1 P5_I1 P2_I2 P1_I2 P3_I2

When learning about sustainable design strategies, learning was inconsistent from the researcher's perspective. The students' ability to fully understand strategies and innovate in a fashion context was hit or miss, depending on the exercise. Participants' ability to implement strategies with an environmental emphasis was hindered by a lack of materials knowledge; specifically, the science behind biodegradability and recyclability. In other cases, students simply perceived more barriers than advantages to strategies, particularly those that required a dramatic reduction or elimination of material consumption (RRJ 8, 12, and 13).

Although students took little issue with the focus on sustainability in the course, some even feeling it increased their own creativity, some clearly arrived at the course "turned off about sustainability" (P1_I1); as one student put it, "I'm not one of the 'go green' people" (P010_R1). This attitude seemed to dissolve over the course of the semester and shift to one of personal responsibility, as students were presented with practical strategies that could be implemented within their field:

P4: I think this class provides us with the ability to be a change agent or at least get us thinking about it, which is more than I really thought about prior to any of this. I think it gets you more comfortable with the idea that one person really can make a difference and it doesn't have to be solving world hunger. You can do it just a little bit at a time by influencing the company that you work for, by recycling, just little things like that. I think it just makes you more aware to the possibilities. (I1)

Seemingly more important to students, however, were an expansive number of learning and development outcomes related to working with others. Some of the most valuable lessons gleaned by students were related to the navigation of conflict. Some discussed the need to confront conflict promptly rather than wishfully thinking time would dissolve it. Most students acknowledged that good communication led to greater inclusion of all group members, discussing an increased appreciation for personal expression and listening to others' expression without judgment. Most participants also identified a general increase in awareness of their own behavior (e.g. strengths, weaknesses, or behavioral patterns). Finally, participants indicated that they had learned that good collaboration, even if it is difficult, requires everyone's involvement and shared labor, and this is preferable to working alone:

P4: I learned that when tension is brewing it's better to speak about it or bring it up rather than to let it go and let it build and present a bigger problem ... I know working in groups takes a lot of work and sometimes there will be tension, but you just have to work through it and know that talking and bringing up issues when they arise is the best because if you let them go then can turn into something bigger and that can halt progress and foster negative emotions among group members. (R2)

P5: Discussing these skills in class made me aware of how I act in groups and what I need to improve on. I immediately knew that I wanted to focus on my input towards the group. I think subconsciously I always thought about this when doing group work, but I didn't really think too hard or focus on it as a skill. Now that I'm aware, it's something that I think about when we are doing group discussion. (R1)

Many of these students brought a negative attitude toward group work to the course, which shifted during the course:

P012: Another epiphany I had was just in my attitude toward group work. I think I am more prepared to go out in the work world and deal with groups on a daily basis because of this class. The skills I have developed in having a group attitude as opposed to individual thinking really increased my ability to take a lot away from group work. The fact that group work can result in a positive final product instead of a horrible dreaded feeling gives me a brighter outlook on working in groups in the future. Learning the steps to working together and dealing with conflict has been a major contributor in this. (R2)

Students also discussed their developmental progress related to working with others, the development of collaborative and cooperative skills associated with ESD. All participants indicated an improved ability for effective communication. Students described an improved ability to “speak up” or express their ideas without being afraid of embarrassment or hurting someone’s feelings as well as an improved ability to listen to others, ensuring their interaction with their group members connoted tolerance, respect, and mutual understanding without being dismissive or critical:

P13: I have become a better listener in this class, asking questions in a non-confrontational way if I don’t understand an idea. Since I was able to understand those ideas and concepts better, I was able to explain my ideas in a way that my group members understood... When you listen, you have to focus on what that person is trying to get across and interpret the message. You also have to respect their idea and their participation in the group whether the idea fits or not. If it is a poor idea, you have to be careful about how you handle the situation. You can’t simply reject their idea. You have to acknowledge it. (R2)

Closely correlated was an enhanced ability to build better ideas *together*. Participants related their ability to build ideas to their improved capacity for democratic collaboration, both leading *and* following, a fundamental component of ESD. Students discussed an enhanced capability to adjust their personal preferences for the good of the group, taking a “we” approach to projects as opposed to working individually. A related theme emphasized by participants was the ability to dive into the work at hand, fully interacting and engaging in the project, sharing information freely, and demonstrating accountability:

P8: Before taking this course I was not a very accomplished group member, that is to say I would help work on group projects and do what was required of me, but I never really got that involved or invested within the group and its dynamics. But with taking this course it required me to fully interact and engage in the group itself and not just the work involved. By learning to listen to all of our group members’ ideas and allowing them to express themselves and learning from their ideas and vice versa, by them allowing me to express my ideas and opinions, I became a very engaged and interactive member of our group, rather than just someone who wanted to just get the work done and not really care about anything else. (R2)

P7: I have been able to let go and see where other ideas can better an overall project. I can still see myself in parts of the work that gets finalized, but even better than that, I am able to see where we all came to an agreement and chose what was best. (R1)

Some participants also described an increased willingness to acknowledge and resolve conflict in a mutually beneficial way:

P6: I really don’t enjoy conflict, I never have. But this class has taught me to step back and look at conflict as a way to grow and see another person’s perspective.

[A group member] and I definitely had the most conflict as we are probably the most different creatively and personally, but we were able to work through our differences by communicating and acknowledging what was causing this extra tension. I feel like this class has forced me, in the best possible way, to be more open to conflict and expressing my opinion in a way that doesn't make others feel boxed in or like my way and thoughts are the only way to go. (R2)

Though values-focused thinking and systems thinking skills were incorporated into the course implementation and were mentioned by a handful of participants, the ability to reflect as well as think creatively and imaginatively made a far greater impression. The course's focus on sustainability and collaboration simply may have overshadowed this aspect of development. Reflection, an important concept associated with ESD, was a chief assessment method in the course. Consequently, participants discussed an increased ability to reflect on their personal behavior or experience with improved action in mind:

P12: When you are working in groups you are working with a variety of personalities and at times it is easy to get frustrated especially when you are just looking at things from your point of view. By having the chance to step back I was no longer upset about the issue; my concern moved to what can I do to improve upon it instead of dwelling upon the issue... learning how to effectively reflect on an experience has been one of the greatest things I have taken away from this class ... I think that this skill has allowed me to not only improve upon myself, but also acknowledge that changes do need to be made and forced myself to confront my own actions. In a way reflection has become a way for me to hold myself accountable for change instead of dealing with the status quo. (R2)

Participants also discussed an improved ability to think more creatively and imaginatively, which was tightly correlated to the course's focus on the future as well as sustainability. Notably, the researcher observed this progress to be tenuous, the students' level of innovation proportional to parameters imposed in the assignment or activity (RRJ 8, 13):

P3: I thought that all the different scenarios the groups were assigned were interesting. I have never thought of myself to be a very imaginative person, so doing this project has been kind of hard for me. I usually don't like to think into the next year, so forecasting to 2025 was difficult. It also made it more fun, because we could basically do whatever we wanted and be however creative we wanted, so that was a fun aspect. (R2)

Finally, students perceived this course as being highly relevant to their future career, anticipating the application of what they had learned to new and different situations in their *real* lives:

P14: I can easily understand why we were given this project and how it will help us in our future careers. Sometimes it is difficult to work on a project that is hard to see the benefits, but with this project the benefits are much clearer and in a real world company if I didn't want to get fired I'd have to learn to communicate more. (R1)

P6: I feel like I am taking away things that will get me through life and have made me a better person, both personally and career related. (R2)

What aspects of the course appear to have the greatest impact on learning and development outcomes? How do students compare this course experience to others in their program?

Table 3 provides a summary of the study's themes related to aspects of the course with the greatest impact. It was clear that ESD had played a significant role in the students' learning and development and that this experience was considered distinct when compared to others in the program.

Table 3 <i>Aspects of the Course with Greatest Impact</i>			
Themes	Reflection 1	Reflection 2	Focus groups
(T)(U) Holistic infusion of sustainability	P2 P7 P011	P2 P5 P6 P7 P011	P7_I1 P1_I1 P4_I1 P5_I1 P1_I2 P2_I2
(T)(L,D) Reality modeling			
(T)(D) Democratic role play	P1 P8 P9 P014	P1 P7 P014	P2_I1 P2_I2
(I)(D) Company training	P3 P5 P6 P011 P012 P014	P1 P012	P3_I1 P5_I1 P4_I1 P1_I1 P2_I2 P3_I2
(I)(L) Real world applications illustrated	P2 P7 P010 P012	P2 P3 P7 P014	P1_I2 P2_I2
(D)(L) Focus on the future	P1 P3 P5 P6 P7 P8 P011 P014	P2 P3 P011 P5	P3_I1 P1_I1 P1_I2 P3_I2 P2_I2
(T)(L,D) The instructor			
(T)(L,D) Instructor responsiveness	P8 P010	P2 P7 P8	P3_I1 P2_I1 P7_I1 P4_I1 P5_I1 P6_I1 P1_I1 P1_I2 P2_I2
(T)(L,D) Interaction with expert	P1 P7 P9 P010	P1 P2 P3 P4 P6 P9 P011 P013 P014	P2_I1 P3_I1 P4_I1 P2_I2 P1_I2
Other			
(T)(L,D) Collaboration	P1 P3 P4 P5 P7 P9 P010 P011 P012	P1 P3 P5 P6 P8 P9 P010 P011 P012	P6_I1 P2_I1 P1_I1 P3_I1 P5_I1 P2_I2 P1_I2 P3_I2
(T)(L,D) Discussion	P4 P5 P6 P7 P8 P9 P010 P011	P2 P3 P4 P5 P010 P011 P012	P7_I1 P6_I1 P3_I1 P2_I2 P1_I2 P3_I2
(T)(L) Authentic assessment	Not mentioned	P013	P7_I1 P6_I1 P4_I1 P3_I1 P2_I2

Chiefly, students described the course as being “all about sustainability,” emphasizing the interrelationship of course topics, which created a “big picture” at the end (P4_I1). According to participants, the holistic infusion of sustainability made the course more cohesive, rather than disjointed:

P2: The class was focused on the whole the entire time, so we were slowly building up things, but we never forgot about what we did in the beginning, because we were building upon it constantly the whole time. Like [another participant] said it wasn't like you learned it, took a test and then forgot about it; you constantly had to keep your mind on it. For parts of our project we wanted to do a certain thing but it affected another thing down the line, so we really had to keep focus on what we were doing and how it would affect the company as a whole. So that kept me really focused on things and really interested in things. I

really liked it rather than just taking tests about it, being involved in the whole process. (I1)

Interestingly, participants described the course experience as similar to other courses because it modeled discipline processes, like the design process, to which they were accustomed. In these cases, participants perceived that those common discipline's practices were simply extended by sustainability.

Participants also considered the use of Reality Modeling, a component of ESD and constructivism, impactful. The use of democratic role-play for collaborative work, particularly the structure of course assignments, centered on leading *and* following, enhanced skills development and was considered most unique in comparison to other courses. Students commented that rotating leadership prevented the domination of one member, something that had clearly been a pattern in previous group work. Likewise, the inclusion of "company training" at the beginning of the course modeled a real work situation, and seemed to poised students for success. Participants also indicated that the ample illustrations of real-world applications utilized in the course positively affected learning. When students could either see or read about how real companies were applying sustainability tenets to their activities, they became more confident and engaged in the application of these ideas to *their* work. Focusing on the future — their personal future as well as the industry's future — had a similar impact. The course's focus on fashion for 2025 seemed the most challenging, but was a conduit of creativity. Consequently, students perceived the applicability of course learning to be accentuated compared to other courses:

P14: In other classes I would just let the dominate person take that role throughout the whole project... giving each member a set title in the beginning of the class also helped decide who would take on the leader role with certain assignments... and I appreciate that because it allowed me to improve on my leadership skills.
(R2)

P3: I think with using the scenarios it makes us kind of think outside of the box more than we have been challenged in other classes. Especially as design students we're the same—the types of designs you do are different but the collections consist of separates that are the same types of pieces and that's been good and challenging about this class... I feel like it forces you to be so much more creative. (I1)

The instructor's highly collaborative and interactive role, chiefly influenced by a dialectical perspective of constructivism, was perceived to significantly impact student learning and development, according to participants. The instructor's responsiveness and accessibility for frequent interaction were emphasized in participant discussions. Some participants emphasized the instructor's ability to explain complex concepts in a way that was understandable to them, whereas others emphasized her willingness to adjust her teaching approach to increase understanding. Participants also described the instructor's high level of involvement and interaction with them as helping them learn course concepts, brainstorm, and assist in their collaborative skills development. Interestingly, the instructor's personal passion for and knowledgeability about sustainability were impressionable:

P2: I think what was really helpful was [the instructor] was really involved in each group. So, if we were stuck on something she would help us since she obviously knew more about sustainability than we did. So, she could direct us to certain websites or readings to figure our way through the problem. (I1)

P5: I've thought about how my positive thoughts on this course might change with a different teacher or group. I feel as though I wouldn't have been as passionate about our project. [The instructor] shows a lot of enthusiasm about sustainability and that really made me more enthusiastic. (R2)

The use of collaboration and discussion, both key constructs of ESD and constructivism, were identified by nearly every participant as enhancing both learning and development, particularly that related to sustainability. Importantly, many participants described a comfort with and a new appreciation for collaborative work because of its dominant presence in the course design:

P3: We have real discussions, we can sit and talk about things and it's not like we're in a class setting, it's more like this [the focus group]. And everybody has so many different points of view that it's great because you can hear them all and nobody feels like they're pressured to say things or that we're going to judge them for what they're saying... It makes it so much less stressful in one sense and I think it makes me retain so much more information when I can talk it out with somebody, when there are more voices going on. (I1)

P6: By the end of the semester I not only felt respect for my team members, but also a kinship. I enjoy their company and while I'm quite sure if we worked together again we would still have very different opinions we would be able to work through them and together create something wonderful... I also didn't know I could enjoy a class so much that was all group work, that thought still blows my mind... I never thought working in groups would teach me so much about life in general, and the interactions that happen on a daily basis. (R2)

Finally, participants identified another core construct of ESD and constructivism, the use of authentic assessment (e.g. projects, reflections, exhibits). Audible in this discussion was students' abhorrence for test taking, which they seemed to associate with short-term retention and a lack of real application:

P4: With the projects we get to apply the [sustainable design paradigms] that really spoke to us and put them together in different ways, which is helpful. Instead of on tests where you have to memorize everything and even things that might not be your thing as much and you don't get a chance to apply that. That's helpful. (I1)

P13: It was a very creative class and I really liked the format of it (more papers and projects; no tests). I don't feel like testing really measures the knowledge gain

of a student. They stress out, usually cram and most of it leaves their head after the exam. I will keep what I learned in [this] class though. (R2)

Notably, some participants commented that the size of this class was unique by comparison to other courses, raising their comfort level to engage and interact with others.

Discussion

Students from the redeveloped course readily embraced aspects of the course that departed from that to which they were accustomed and left with a positive learning and development experience. The potential novelty of such an experience must be considered with these findings, but the outcomes experienced by learners and the role ESD played in these outcomes provides some important context for the integration of sustainability in a field of study focused on the making and marketing of things.

First and most expectedly, students experienced a substantial increase in their knowledge and awareness about sustainability and sustainable development as well as implementation strategies. Admittedly, these students had little or no background on the topic, but more importantly, students seemed undaunted by the applicability of sustainability to fashion. Students were open to this exploration and perceived these concepts to be highly relevant to their field and transferable to their future profession. Interestingly, some students had come to the course feeling detached from sustainability, but this soon transitioned into a heightened awareness of their own behaviour and an increased sense of responsibility to make change. Although students sometimes struggled to balance the economic bottom line with other tenets of sustainability, this struggle did not dominate student activities. A greater deficit was a seeming lack of understanding about the science behind materials, an area of opportunity for the fashion curriculum. Notably, sustainability was framed in this course as a creative activity and an exciting opportunity to innovate, an effective approach. An interesting area of future research would be to explore how the preconceptions and motives of students in these fields interact with the approach taken in the classroom. This area of study may provide more clear-cut methods of approaching sustainability in other seemingly counterintuitive contexts.

Powerful outcomes of the course experience were related to the integration of change agent skills focused on working with others: Cooperation and collaboration, effective communication, and conflict resolution. Stories told by students indicated that many arrived at the course with ample emotional baggage from previous group work. Clearly, assuming students will have a self-discovery experience by virtue of being together is erroneous; in fact, if students are not developing the tools to collaborate effectively, the odds are stacked against their success by putting them in situations where their learning and development may be hindered rather than helped. In previous group experiences, students clearly had developed a skewed perception of leadership. For instance, many students discussed struggling to relinquish control, whereas others struggled to step up and lead, neither embracing a balance between the two. Specifically, the democratic concept of leading *and* following was a new idea that the students considered very effective. This approach culminated in shared work that was both cooperative and equitable. Importantly, when students were provided some structured training and were held accountable

for the application of this training, growth abounded. Many students noted how they were applying these approaches in other courses, at work, and at home. This training consumed only a small portion of class time, which demonstrates that these skills may be integrated throughout courses without dramatic alterations or interference with course content. Another area of future research ripe for development is the integration of these skills across the curriculum to better prepare learners for professional success and sustainable development competence while increasing the effectiveness and desirability of group work.

Students also described improvement in critical thinking skills, though somewhat overshadowed by those related to working with others. Students found the use of reflection in the course a helpful tool to reflect on their own behavior, which in many cases was a new practice. Likewise, students felt the course experience stimulated their ability to think creatively and imaginatively and cited sustainability as a challenging but inspiring conduit. Notably, the researcher observed the use of frameworks to be critical to prompting creative and critical thought. Admittedly, the critical thinking skills like values-focused thinking and systems thinking, to which far less class time was devoted, may have been perceived as extraneous. This weakness may also be related to the assessment method used in the study, a self-report, which may not be the ideal method to assess thinking skills. Likewise, reflection is not a common assessment method in fashion education, particularly for marketing students. Although reflective writing seemed effective for understanding progress in collaborative skills, an alternative assessment method may have unveiled important nuances. But students did note that it was helpful to be required to pay attention to their experience. Assessment methods for these particular thinking skills related to sustainable development are in great need of exploration and experimentation.

The constructs of ESD were clearly impactful in the course. When ESD was holistically applied to the course design, aligning its purpose with sustainable development, students readily adapted to the material with little resistance. The broad and interconnected design of the course aided them in developing a “big picture” about sustainability. Course concepts built upon one another, supporting retention and application. The course also utilized common discipline processes to which students were already accustomed, which may have enhanced the perceived relationship between sustainability and the course topic. This indicates the feasibility of integrating sustainability without losing signature curriculum features.

Reality modeling was also highly effective in engaging students through industry role-playing and illustrating the connection between sustainability and the discipline. Interestingly, students considered the connection between the required course readings and their application to course work superior to other courses. These approaches seemed to prompt students to think specifically about their personal future, both professionally and otherwise. An important implication is that fostering sustainability-minded and highly skilled professionals requires a high level of engagement, one likely to be fostered only by making content personally relevant to the student. This approach requires educators to be more connected to real-world events and applications as well as more responsive to student needs.

Likewise, participants considered the use of pedagogical approaches such as collaboration and discussion a necessity for learning about sustainability. A chief feature of this high level of interaction was the small size of the class, which created some intimacy, allowing for increased

engagement and interaction. Indeed, the tension between constructivist pedagogy characteristically used to implement ESD and large class size has been noted in the sustainability education literature. Practitioners who teach larger classes may wonder how ESD may be implemented. Certainly, a smaller number of learners in the classroom allows for greater depth of discussion, exploration, debate, and discovery. On the other hand, a number of techniques used in the current case such as democracy in the design of students groups, reflection as a mechanism for attention paid to behavior, and infusion of sustainability and reality illustrate just a few methods by which a course could be affected without mandating a reduction in class size. Determining when a small class size is most important to deliver certain ESD outcomes is crucial. When a foundational understanding of sustainability is necessary early in a learner's program, perhaps a small class size is ideal, whereas other techniques such as the use of democracy could be used for larger numbers to deliver other outcomes related to working with others.

Conclusion

This study provides some important insights into how sustainability and sustainable development may be implemented in a curriculum focused on the making and marketing of things. The study also contributes to the current dialogue about sustainability education by providing a rich description of how students *experience* alternative approaches. The study also demonstrates the necessity of moving beyond greening techniques and executing holistic application of sustainability and sustainable development at the course level. Disciplines like fashion must continue to dialogue and develop strategies to navigate unsustainable root metaphors such as consumerism and growth in the curriculum. As the fashion industry and other industries continue to seek economic development within the confines of the ecosystem's limits, the stakes are high for education to respond by preparing sustainability-minded change agents to lead new and evolving adventures on the green.

Acknowledgements: This project was supported by funding for sustainability research in food and agriculture science. This is contribution #12-433-J from the Kansas Agricultural Experiment Station. The authors would also like to thank Kim Hiller Connell, Barbara Anderson, Jeoung-Hee Kim, Sally Yahnke, and Laura Brannon for their mentorship during this project.

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