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Teaching Textiles: Critical Thinking and Application of Knowledge

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Sustaining the planet for future generations requires teaching both specialized and general education, emphasizing learning as a life-long process so that students can evolve to meet the needs of tomorrow that may be different from today in ways we can’t even visualize. We crafted assignments in the Textiles class to push students beyond the vocational and professional to enable thinking that evolves with the constantly changing universe, linking content proficiency with constant exploration, curiosity and experimentation. In order to coach students to think beyond the basic facts and into the future, critical thinking projects were introduced to a) identify textiles and b) to explore new developments in the textile and apparel industry. Both projects were designed such that the outcomes were aligned with the course objectives.

**Textile identification.** As a general education natural science class, one of the objectives of the course was to teach the scientific process by using laboratory equipment to identify fiber content and test various fabric performances. One semester, after analyzing the content, we noticed one major component of the scientific experiment, to provide evidence to support or reject hypotheses or answer specific research questions, was missing. Consequently, we developed a fabric analysis project that would address the missing component of textile testing and encourage critical thinking. For the project, each student purchased three samples of fabric that included a total of 9 criteria: a natural fiber, a regenerated fiber, a synthetic fiber, woven, knit, and non-woven fabrications, a staple, filament and fancy yarn, dyed, printed, and finished fabric. The goal was to analyze fabrics, determine characteristics and to answer research questions and/or support/reject hypotheses. The final phase of the project involved recommending three end uses for each fabric sample and describing five serviceability characteristics relevant to the end-uses suggested by the student. Outcomes of this fabric analysis not only prepared the students for the final exam but also included the following. Figure 1 shows a student’s final project.

- Applying scientific principles and practices in a laboratory setting,
- identifying and describing fiber content and yarn characteristics, fabrication, dyeing, printing, and finishing methods using appropriate vocabulary,
- understanding the application of industry-based textile testing standards,
- determining textile appropriateness based on serviceability concepts and textile characteristics, and
- developing skills in critical thinking and analysis.

Figure 1: Final textile identification project
New developments in textiles. Another course objective, to characterize the textile complex in a global context, was cultivated by challenging students to identify a new textile development topic from a report on WGSN, a textile and apparel industry exclusive website. After selecting the topic, students were guided to examine the information from the WGSN report to determine what kind of associated information was needed to thoroughly and critically analyze the topic. Students were required to support the topic with at least two additional articles, one popular culture, (website, blog, newspaper, etc.) and one peer reviewed journal article to provide relevant evidence to support the discussion, conclusions, and/or consequences. Students wrote an analysis of the topic that included reflection upon how the process of learning about and analyzing the topic influenced their understanding of the textile industry as a whole. Finally, the students prepared a power point that communicated the knowledge gained.

Outcomes of the new developments in textiles assignment included

- Identifying recent textile material developments,
- examining, critically analyzing and synthesizing information,
- linking information from the trend forecasting company, WGSN, to the larger textile and apparel complex in a reflective and analytical manner, and
- expressing the content in an analysis that demonstrates both visual & written communication skills.

One student’s critical analysis included these thoughts:

“While these findings are no doubt cool, one of the main problems I find in the logic of the authors is the emphasis on the future popularity of this technology. I find this interesting, but not well-based. I’m not saying the idea of this technology isn’t useful and that it won’t be popular, but there isn’t a lot of evidence that it will be. There is a part of my peer-reviewed article (Lam, 2006) that talks about a ‘recent’ innovation by the Gap. They made an FM-radio accessible hoodie. That article cited it in 2006. It’s been 8 years, and this technology isn’t every day; I’ve never even heard of that technology. So while I’m sure it’s very interesting, there’s no real guarantee this type of technology will have enough interest to make it into anything revolutionary.”

Student reflection regarding the assignment included:

“Spider silk and its significance in science and textiles is extremely interesting to me. I am amazed that humans can study and deconstruct something in nature and attempt to recreate it.”

“This article reminded me of all the waste going into the industry. Not just the plastic waste, but also the energy used to make all the clothing. There need to be more initiatives to use biodegradable products and recycled materials.”

Both of these projects, textile identification and new developments in textiles, required students not only to synthesize the subject matter of textiles, but also to engage in critical thinking and analysis beyond the given content. Student work and reflections revealed conscious attention to higher-level thinking that facilitated learning. Further development includes evaluating how students draw upon the critical thinking knowledge gained to apply those skills in diverse contexts, and collaborating with other instructors to develop similar critical thinking projects in the curriculum.