Incorporating Cotton into the Curriculum

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According to the National Cotton Council (NCC, 2023), cotton fiber consumption is expected to increase worldwide. This predominate fiber is used in various markets from home textiles to a wide range of apparel products such as denim, socks, and more (CottonWorks, 2023). As such, fashion undergraduate students are emerging textile and apparel professionals that should be educated on this fiber. Therefore, this study aimed to use free internet-based Open Educational Resources (OER; Mishra, 2017) to introduce students to information on this fiber and determine what students reflected on as important information to share from this source. The OER used for this qualitative study was found on the CottonWorks™ (2023) website, www.cottonworks.com. The instructor used this industry-relevant resource to provide 23 fashion students with information on the topic of cotton by incorporating content from the CottonWorks™ (2023) website into the curriculum. The instructor chose to do an active learning think-pair-share activity (Linsenmeyer, 2021) for a face-to-face fashion fundamentals course, which is a gateway course into the fashion curriculum. Students were divided into seven groups, and each group was comprised of approximately two to four students. Each group was given a team-based learning assignment (TBL; Banning & Gam, 2013). The class was shown the discussion prompt shown below and told to discuss with their group members what they had learned before sharing their insights with the class. These individual reflections were then analyzed using content analysis to discover the main themes.

Discussion Prompt: Look over the Fiber Science section of the CottonWorks™ website (https://[www.cottonworks.com/en/topics/sourcing-manufacturing/fiber-science/)](http://www.cottonworks.com/en/topics/sourcing-manufacturing/fiber-science/)) to learn more about the differences in natural vs. synthetic fibers along with cotton sourcing, classification, development, harvesting/ginning, qualities/evaluation, and more. In your group look at your assigned Fiber Science Topic on the website, try to summarize with each other what you learned. Each person should pick a key takeaway that is different from your team members.

Content analysis main themes with student reflections from the CottonWorks™ website - Fiber Science section is shown below:

Natural vs. Synthetic Fibers Discussion Topic:

Students reported the following: 1. Synthetic fibers are insoluble and made of chemical polymers, and 2. Natural fibers can be odor resistant, biodegradable, and cheaper. Resulting theme: *Chemical Properties* were the main distinction between synthetic and natural fiber expressed (e.g., insoluble compared to biodegradable).

Cotton Fiber Development & Maturation Discussion Topic:

Students reported the following: 1. Each growth stage is important for abundant fiber development, 2. The primary root may reach a depth of 10 inches or more by the time the cotyledons unfold, and 3. The cotton seed contains a seed coat surrounding an embryo with two well developed cotyledons. Resulting theme: *Plant Anatomy* (e.g., primary root, cotyledons, seed coat, embryo) was described the development and maturation of the plant.

Cotton Fiber Harvesting & Ginning Discussion Topic:

Students reported the following: 1. Cotton has natural advantages for in-home lifestyles, 2. Cotton pickers operate by using spindles and barbs to pick the cotton, 3. The spindle bar rotates and then when it is contacted with the seed it is pulled out of the cotton, and 4. The gins clean and dry the seeds. Resulting theme: *Machinery* used to clean the seeds.

Cotton Fiber Qualities & Evaluation Discussion Topic:

Students reported the following: 1. One takeaway is that the staple length is reported as the average length of the longer half of fibers, 2. In the cotton industry, there is a specific job called a cotton classer, and 3. Finally, fiber strength is determined by genetics, so cotton variety plays an important role in fiber quality. Resulting themes: *Fiber Length* and *Fiber Strength* were discussed for evaluating cotton fiber quality.

How Fiber Quality Impacts Your End Product Discussion Topic:

Students reported the following: 1. Some key takeaways are that every bale of cotton is different, and that cotton is purchased based on properties that the fibers hold, 2. Cotton is identified differently based on species, variety, location of growth, and growing season, 3. Every bale of cotton is different, and each bale of cotton produced in the US is instrument tested and graded by the USDA, and 4. There are many classifications on cotton such as length, uniformity, strength, micronaire, and color grade. Resulting themes: *Cotton Identification* (e.g., cotton species, variety, location, growth season) and *Cotton Classification* (e.g., length, uniformity, strength, etc.).

This interactive TBL classroom assignment was very effective as students accurately shared specific key takeaways from their assigned OER website section to share with the entire class, which developed into specific discussion themes (e.g., cotton classification, etc.). Due to the enormous variety of OER topics covered on the CottonWorks™ (2023) website, this activity was best covered in groups as a “divide and conquer” content activity. The use of TBL was useful due to classroom time constraints, allowing everyone to learn the various topics using the active learning think-pair-share approach. The entire classroom was able to learn from another group through the sharing out part of this activity. In the future, the instructor plans to add a low-stakes quiz after students complete this activity to ensure all students have the benefit of reinforcing their knowledge from this activity to earn additional points.

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