Experiential Learning in an Accelerated Classroom: Experiments and Field Trips and Competitions, Oh My!

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Innovative Approach or Practice that Merits Sharing with Others

New course development can be challenging, especially when considering the demands of teaching during shorter, summer sessions. Regardless of the length of the course or time in the classroom, the impact on students is fundamental for successful course development and implementation (Moon, 2001). Subject matter is usually concentrated (Parlett and King, 1971) with students focusing on a singular topic, different from most semester-long curriculum. A variety of activities are also often included as course components, each of which must be carefully considered for their value-add and impact given the short time frame (HEA, HEBS, HPW, HPANI, 1995). According to experiential learning, a constructivist learning theory, the learner is an active participant in the educational process and learning is achieved through a continuous cycle of inquiry, reflection, analysis, and synthesis (Lewis and Williams, 1994; Bartle, 2015). Guided by this theory and pedagogical method, the instructor implemented a hands-on experiential learning approach to maximize the impact of a 6-week summer course.

In partnership and with funding from the Cotton Incorporated's *Cotton in the Curriculum Program*, students in the developed course were provided the opportunity to conduct a textile testing experiment of their own design within the confines of the university's lab capabilities. The instructor provided students with the tools and training necessary to perform their accelerated research projects in one of three testing settings: fabric testing, manikin testing, and wear testing. Students participated in the following course components: (1) design, execution, and analysis of research experiment, (2) experiential travel to Cotton Incorporated and other textile industry headquarters, and (3) dissemination of research findings through a student presentation competition. Through these activities, students used textile curriculum knowledge of cotton fibers, fabric construction, and performance finishes to design, conduct, and communicate product analyses.

Purpose for Identified Audience

The purpose of disseminating this information through presentation to other educators is to assist instructors who wish to implement experiential learning components within the context of the textile and apparel classroom. New instructors or those updating their course curriculum can benefit from the knowledge of someone who has developed and implemented experiential learning within the confines of a short summer course. Further, any educator wishing to participate in the Cotton in the Curriculum Grant Program, will find this information useful. The presentation will discuss the structure and implementation of the experiential learning components within the accelerated 6-week classroom setting, as well as overview the challenging barriers faced and how they were overcome to provide students with an impactful learning experience. Specific student outcomes and project examples will be provided.

Implementation of Practice Clearly Defined

The Cotton in the Curriculum Grant Program serves to promote knowledge about cotton among students preparing for careers in the apparel and textiles industry (Cotton Incorporated, 2024a). This program supports funding for Cotton Education Innovation Grants ($10-$50K) to develop comprehensive educational programming in cotton product development. The instructor and PI of a 2023 grant developed a short, 6-week summer course titled "A Survey of Cotton Performance Technologies." Cotton Incorporated has developed a wide range of performance finishes from TransDRY® and WICKING WINDOWS≤ for moisture management purposes to TOUGH COTTON≤ AND PUREPRESS≤ for improved durability and appearance retention (Cotton Incorporated, 2024b).

Students in the developed short course were required to have completed a basic textile science course and the majority had also completed a product evaluation or quality assurance course in which basic textile testing was conducted. Students were first tasked with conducting a Cotton Performance Technology Review of their selected performance technology (week 1). Once selected and better understood, participants were guided through research question development centering around their selected performance technology. Students completed the Research Purpose and Objectives worksheet, along with their initial experimental design in week 2.

Thanks to funding from Cotton Incorporated, performance technology garments were identified and sourced for each student. The grant also supported a North Carolina Textile Tour in week 3 in which students visited Cotton Incorporated and the American Association of Textile Chemists and Colorists headquarters in Raleigh, NC, along with the NC State Wilson College of Textiles. Students were able to see fiber and yarn spinning, color, weaving, knitting, and finishing and dyeing facilities, along with physical testing laboratories at all three sites. In addition, this trip allowed students the unique opportunity to reflect within the course's fostered community. This experience broadened the career path horizons of all students.

Upon their return to the classroom in week 4, lab experiments were conducted and by week 5 students were completing their Project Results & Analysis worksheet which walked them through organizing, presenting, and statistically analyzing their test results, along with connecting their findings back to their original research questions. In week 6, students presented their experiments via a student presentation competition with $1,750 in student awards given to the top three presentations. External industry professionals and educators judged the competition. This experience provided students with a relaxed, yet formal setting to gain oral presentation practice in front of business professionals while simultaneously building their network.

Description of Success of Practice in Fostering Desired Learning Outcomes

All students reflected that participating in this course was eye-opening and beneficial in many ways. Students were able to meet all course objectives from describing characteristics unique to cotton to critically approaching a research problem and analyzing the results of their experimental findings. These results support previous findings in which experiential learning allows for knowledge creating through a transformational experience (Kolb, 1984).

Indication of Plans for Continuation, Revisions, or Follow-Up

The overarching response from students indicates experiential learning was effective despite the accelerated nature of the course. Executing such a course without funding, however, would be more challenging. Alternative modes of course delivery outside of onsite travel could be explored via the CottonWorks website which now features new videos of the same facilities toured in this course. Future course development, regardless of length of time, should consider the adoption of as much experiential learning as possible, especially in a textile and apparel setting where equipment, devices, and instrumentation may be readily available but not traditionally used for teaching purposes.

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