Jan 1st, 12:00 AM

Developing a Textile Laboratory Activities with Curriculum Base

Shu-Hwa Lin  
*University of Hawaii at Manoa, shulin@hawaii.edu*

Kristen Domingci  
*University of Hawaii at Manoa, kwid@hawaii.edu*

Follow this and additional works at: [https://lib.dr.iastate.edu/itaa_proceedings](https://lib.dr.iastate.edu/itaa_proceedings)

Part of the [Fashion Business Commons](https://lib.dr.iastate.edu/fb), [Fashion Design Commons](https://lib.dr.iastate.edu/ftd), and the [Fiber, Textile, and Weaving Arts Commons](https://lib.dr.iastate.edu/ftw)

[https://lib.dr.iastate.edu/itaa_proceedings/2017/posters/169](https://lib.dr.iastate.edu/itaa_proceedings/2017/posters/169)

This Event is brought to you for free and open access by the Conferences and Symposia at Iowa State University Digital Repository. It has been accepted for inclusion in International Textile and Apparel Association (ITAA) Annual Conference Proceedings by an authorized administrator of Iowa State University Digital Repository. For more information, please contact digirep@iastate.edu.
Developing a Textile Laboratory Activities with Curriculum Base

Shu-Hwa Lin and Kristen Domingci
University of Hawaii at Manoa, USA

Key words: textile-lab, manual, games, curriculum-base

In order to plan a successful basic textile laboratory manual, the textile laboratory manual has to cover the textile fundamental knowledge, required competencies, criteria, instructional strategies, and evaluation techniques. The challenge for many schools could be testing facilities. Because the textile laboratory was too small to accommodate up to 20 students, with 20 in each section, the textile laboratory was relocated to one of the science labs. This textile testing laboratory is followed by Textile Fundamentals class. Textile Fundamentals is a sophomore class with an introductory clothing course as a prerequisite. Textile Testing is a follow-up course for student development in textile testing and evaluation. The division of the course into 20 labs of 75 minutes, meeting twice a week, accommodates class scheduling. Instead of the laboratory manual, AATCC and ASTM test manuals were suggested, laboratory procedures, calculation formula in Excel sheets, and material requirements were developed to meet laboratory activities, as well as each report guide line. Through the use of 20 AATCC and ASTM laboratory activities throughout the semester, students review textile fundamental knowledge and prepare laboratory reports that reflect industry standard communications. The AATCC and ASTM standard tests replicate real-life testing conditions for fabrics and will help students to communicate their understanding of textile testing procedures for the industry and product development. The sections of the labs are broken up into fiber content, appearance, and physical properties tests.

There are a good number of students in the Textiles and Apparel program who were afraid to work in chemistry and other science areas. It is extremely important for design and merchandising students to be prepared in basic concepts and techniques of chemistry and science, such as using microscopes, dye cells, and preparing slides for observation under a microscope. Those textile laboratory concepts and skills could prepare students for the apparel design, production, or merchandising workplace at a higher level job upon graduation. To help students overcome their fear of chemistry and other sciences, bringing confidence back, is the key to success.

In order to be better prepared for the challenges of the textile testing class where fiber and fabric knowledge is utilized constantly, students are prepared with the textile fundamentals class in order to generate basic textile knowledge. However, textile testing class has been developed to be a partial review of the fundamental knowledge gained in textile fundamentals through the use of review quizzes and laboratory writing assignments. The learning activities are also extended from the classroom to the playful learning environment (PLE), an innovative playground enriched by technological tools. Curriculum-based learning was provide by instructor and four groups of students with game co-creation, play, and computer (and TV show) games in the PLE.

Quizzes are also a vital and integral part of development of the textile testing class course. Each quiz focuses on a fiber (cotton, silk, polyester, etc.) and the basic properties of the fiber. Generating a quiz for each fiber pre-arranges knowledge for the basis of the laboratory reports – the students know what to look for in regards to testing and thus are more motivated to write about the results of the testing. To correspond to the basic organization of most introductory textile textbooks, the 20 textile labs are divided into three sections: appearance, physical, and colorfastness. The fiber identification test was used to review textile fundamental knowledge. From recognizing fiber properties to product use,
the first laboratory attempts to utilize students’ experience in the classroom. Showing a variety of types of fabric made of the same fiber could bring students into the textile world. Students were trained to observe the appearances of fibers (i.e., cotton, flax, wool, silk, nylon, polyester, rayon, acrylic, acetate, etc.) using a single lens microscope at the elementary level in the fundamentals class and trinocular viewing head microscope with digital capture system in the textile testing class. Students will be able to save digital images of their microscope observation. Also, students reacquaint themselves with the textile fundamental knowledge by seeking out other resources for their laboratory reports outside of textbooks. This generates new knowledge, as many students utilize studies and articles found in scientific journals regarding textiles. Incorporation of real life application is also important. A field trip to the university book store to study and compare various merchandise for specifications and quality was added to the curriculum as a real-life study. Other activities included that do not necessarily focus on textiles but apply to the overall study of quality and merchandise include writing and discussing quality specifications for garments, specifying garment measurements, and watching videos about product quality and product testing. However, the main goal of the writing intensive for the textiles testing class is to develop both the student’s writing skills and develop their technical industry writing based on the laboratory observation. The main features of the laboratory report are discussion and conclusion sections, in which the student demonstrates their knowledge of relation between their textiles knowledge and the labs in which they test the textiles. Understanding of physical and inherent properties of the fabrics is required to pass the course, and the laboratory reports generally are an accurate reflection of how far the students’ learning has progressed. Furthermore, the writing intensive grade helps to train the students in writing professional textile science reports for the apparel industry. The reports include the use of formal writing skills to accurately describe testing conditions and applications. On a final note, the laboratory reports also represent how the students’ learning can relate to the larger picture – oftentimes, they will refer back to their experience as consumers and be able to link their newfound understanding of the textile testing to their understanding of the industry as a whole. Lastly, the understanding of how to perform the textiles testing laboratories is the most important aspect of development for the students. Each student is asked to lead a laboratory, so that they understand how the laboratory works and how each testing machine works. By utilizing this lab-leading, the professors are able to answer questions one-on-one and cooperation between classmates is encouraged through communication of the laboratory procedures.

In conclusion, a textile testing course has been developed to further textile knowledge to the professional level. From the basic textile fundamental course, to the textile testing course, we help to expand the students’ knowledge of fabrics. In order for the students to gain confidence, the gradual incorporation of knowledge is necessarily step-by-step. Activities such as the laboratory assignments, as well as any in-class assignments and discussion, helps to boost the confidence of the student to seek further textile knowledge for themselves. The knowledge of textiles and characteristics of the fabric will help students to acquire preparedness for product development. Students are very pleased to use trinocular viewing head microscope. The results indicate that the students considered learning in groups, through co-creation and turning fact into games, to be a rewarding way to learn, practice group work and use their imagination for a common goal. Students host games and felt their role was important and challenging, especially in terms of the amount of tutoring and lesson planning. These activities show that to foster creativity, imagination and group work skills with academic achievement is to integrate fact and a playful learning environment in teaching, studying, and learning.