

**Incorporating Fire Safety Training into Preservice Teacher
Laboratory Safety Instructional Practices**

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Introduction

Safety is of the utmost priority in agricultural education laboratory environments (McKim & Saucier, 2011a; McKim & Saucier, 2011b; McKim & Saucier, 2013; Phipps, Osborne, Dyer, & Ball, 2008). This is particularly true in agricultural mechanics laboratories, where dangers can range anywhere from sharp edges on new saw blades to the risk of flammable gasoline vapors (Phipps et al., 2008; Saucier, Vincent, & Anderson, 2014). Such hazards can be minimized when teachers are aware of, and practice, safe procedures. Knowledge in appropriate maintenance and use of safety equipment is crucial in ensuring a safe working environment for agricultural education teachers and students (Phipps et al., 2008; Saucier & McKim, 2011b).

The Methods of Teaching Agricultural Mechanics (AGEDS 488) course at Iowa State University (ISU) serves as the agricultural mechanics content course for preservice teachers. Throughout the course, students receive instruction in a variety of topics, including teaching principles, technical skills, and laboratory management and safety, all within the context of agricultural mechanics. Much attention is paid to the laboratory management component, especially safety, as the course progresses each semester. As indicated by prior agricultural mechanics education scholars (McKim & Saucier, 2011a; McKim & Saucier, 2011b; McKim & Saucier, 2013; Saucier et al., 2014), laboratory management includes a wide variety of safety-related functions, and teachers must be prepared to address such challenges. As safety-related equipment can range from eye and ear protection to fire suppressing equipment, such as fire extinguishers, typically found within agricultural mechanics laboratories, preservice and inservice teachers should be competent to ensure that quality safety equipment is available at all times (McKim & Saucier, 2011a; McKim & Saucier, 2011b; McKim & Saucier, 2013; Saucier et al., 2014). Perhaps a fire safety training session for preservice teachers would help to address at least some of these competency needs.

How it Works

During the Fall 2017 semester, the AGEDS 488 course instructor contacted the ISU Environmental Health and Safety Services (EH & S) staff and requested assistance in providing fire safety instruction. The course instructor specifically asked that the EH & S staff members provide hands-on instruction for the AGEDS 488 students. As the EH & S provides numerous educational opportunities related to fire safety (ISU, 2017), two staff members volunteered to provide a two-hour-long fire theory and safety and fire extinguisher use training program. A training session date was agreed upon by the course instructor and the EH & S staff members.

During the two-hour training session, 10 AGEDS 488 students were provided both classroom-based instruction in fire theory and safety as well as hands-on instruction in fire extinguisher use. During the classroom-based instruction portion, topics such as the fire triangle, electrical safety, and laboratory fire safety equipment usage were covered using an EH & S staff member-created PowerPoint presentation and a question-and-answer session. The subsequent hands-on training portion required the students to use water-shooting fire extinguishers to

suppress a fire ignited on a portable, propane-powered module. The portable fire module used water-sensitive sensors located at the base of the flames. As a group, students were instructed to aim at the sensors near the base of the flames, mimicking extinguishing a fire in a real-life scenario.

Individually, each student practiced using a fire extinguisher at least once. Some students were able to quench the flames quickly, while others struggled to douse the flames at first. Between each fire extinguisher use attempt, an EH & S staff member re-ignited the fire module. Each student was given as much time as needed to practice with their fire extinguisher, and several students volunteered to attempt the procedures several times. The course instructor and graduate teaching assistant participated as well, as neither of them had used an actual fire extinguisher before. In one instance, a fire extinguisher malfunctioned and failed to spray properly, providing an opportunity to discuss how to prevent and solve fire extinguisher-related issues, such as a loss of internal propellant, and so forth. At the conclusion of the training session, the EH & S staff members de-briefed the students, course instructor, and graduate teaching assistant and asked for any clarifying questions about the training session's topics.

Implications

Anecdotally, the AGEDS 488 students reported that they thoroughly enjoyed the opportunity to receive instruction in fire safety training, particularly in how to properly use a fire extinguisher to suppress a real fire. Most of the students acknowledged that they had never used a fire extinguisher before and suggested that this activity be replicated in future semesters of the AGEDS 488. The EH & S staff members indicated their willingness to perform training sessions for future AGEDS 488 offerings.

Future Plans & Advice to Others

Saucier et al. (2014) noted that being able to properly use and maintain safety equipment (e.g., fire extinguishers) is important in managing an agricultural mechanics laboratory. As such, the AGEDS 488 course instructor intends to continue providing fire safety training to each semester's students and he recommends that other agricultural education teacher preparation programs consider implementing a similar practice somewhere within their required coursework. In accordance with preparing preservice teachers to safely and effectively manage agricultural mechanics laboratory environments, the AGEDS 488 course instructor intends to implement other forms of safety training, such as cardiopulmonary resuscitation (CPR) training, in future semesters as well.

Costs

The ISU EH & S staff members provided the fire safety training session at no charge. If a teacher preparation program desired to purchase the supplies used during the hands-on fire extinguisher training, however, it could be expected that each water-shooting fire extinguisher would cost approximately \$100.00 while the portable, propane-powered fire module would cost approximately \$600.00. A tank of propane would be needed to fuel the fire module, which would be expected to cost approximately \$50.00.

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