Teaching Tips/Notes NACTA Journal

The Sixth Sense…Developing an Agricultural Mechanics Laboratory Awareness

Introduction

The nature of the agricultural mechanics laboratory combined with the inexperience of secondary students and the proximity to dangerous equipment and chemicals creates the potential for injury (Dyer and Andreasen, 1999). Lawver and Fraze (1995) concluded that 13.2% of students examined indicated being injured in an agricultural mechanics laboratory. More recently, a study by Knight et al. (2000) that examined Utah school shop accidents determined a shop injury rate of 7.1% among students in grades 7 through 12. Eighty-eight percent of these injuries involved shop equipment. The prevention of these injuries is primarily the responsibility of the instructor. Gliem and Miller (1993) reported that administrators believe laboratory equipment safety is primarily the teacher's responsibility.

The agricultural mechanics laboratory presents unique safety challenges as a learning center within the secondary school system. The inherent risk of working in such a laboratory requires instructors to be trained to provide lessons that are both safe and engaging (Dyer and Andreasen, 1999). The ability to accomplish this can be enhanced by developing an agricultural mechanics laboratory sixth sense. This situational awareness, or sixth sense, is the ability to observe situations and anticipate potential human hazards. Observing students in agricultural mechanics laboratories from simultaneous multiple perspectives can provide insight into the identification of potential hazards.

The development of a teacher's agricultural mechanics laboratory awareness is cross linked between two priorities of the national research agenda. Those priorities are: Priority 2 – new technologies, practices and products adoption decisions, and Priority 4 – meaningful, engaged learning in all environments. Supporting the national research agenda will provide useful information in the training of future agriculture teachers.

Procedures

Agricultural mechanics laboratory awareness is comprised up of three senses: vision, hearing, and smell. The following are the steps used for enhancing each of the pre-service teacher's senses. Star and Strickland (2007) concluded the use of video in pre-service teaching methods courses increases the ability to notice features of the classroom environment. Split-screen playback video ability provides pre-service teachers with the opportunity to see potentially unsafe behaviors of students in the agricultural mechanics laboratory that might have otherwise gone unnoticed.

Vision

Step 1. Students will teach a lesson
   i. Video recorded for replay with split-screen technology
Step 2. Students will complete a self-reflection prior to watching their recorded lesson
Step 3. Students will review video
Step 4. Students will complete a self-reflection and compare it with their first reflection

Hearing

Step 1. Students will listen to shop noises

a. Noises would include running equipment, opening of doors, cabinets, etc.
b. Video recorded for replay

Step 2. Students will have to identify the source of the noise and location
Step 3. Students will review video
Step 4. Students will complete an evaluation
a. Students will identify shop noises while not looking at equipment

Smell

Step 1. Students will be exposed to various smells that can occur
a. Smells would include acetylene, flammable liquids, chemicals, burning materials that are associated with improper uses or faulty equipment

Step 2. Students will complete an evaluation
a. Scenario based – given a situation what type of smell would be present
b. Smell test - students will identify smell when they are presented by instructor

Results

Students have demonstrated more awareness of their surroundings, especially with identifying potentially hazardous situations. They have been more active in alerting the instructors of unsafe practices, behaviors, and equipment before they could cause serious injuries or equipment damage. In one instance students identified a damaged hole saw blade prior to operation that could have resulted in a serious hand injury. The students have also become more aware of the noises that are not typical with the laboratory activities associated with that lesson such as binding plywood while attempting to cut it on the table saw. The students alerted each other and the instructors of something burning when an individual was operating a saw with a dull blade. They have also started to police each other more as they observe unsafe habits and/or situations.

Future Plans

At [State] University, this procedure will be used in the pre-service methods of teaching agricultural mechanics course. The researchers will track the students' process from the beginning of the course through the final evaluations to track their enhancement of their sixth sense in an agricultural mechanics laboratory. The researchers recommend investigating the awareness levels of novice, intermediate, and advanced teachers that have taught agricultural mechanics courses to indicate what level of awareness pre-service teachers have attained compare to experienced teachers.

Resources Needed

The only resources required for this project were media equipment and installation. Media equipment included multimedia video projector ($895.00), two network cameras ($1,336.04), multiple microphones ($485.30), and video and audio accessory equipment ($1,028.42). When combined with equipment installation ($1.662.38), the project cost was $5,407.14. Other costs associated with this activity are minimal including scrap wood and gas.

References

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