Student safety education in Texas agricultural mechanics classrooms and laboratories: A student's perspective on safety education

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Introduction

Agricultural science classes can prepare students with the knowledge and experience to pursue a future in the agricultural industry. Shoulders and Myers (2012) noted that students can learn a number of traits and "skills through experiential learning" by participating in agricultural classes (p.124). These students learn traits or skills that are highly employable, but more importantly, learn how to safely perform them while working. Langley and Kitchel (2013) stated that "the agricultural mechanics laboratory provides a means for students to learn in a safe and controlled environment" (p. 261). Furthermore, performing a skill safely can prevent unnecessary accidents and lessen the risk the agricultural industry may convey to workers. When "incorporating occupational safety and health into vocational, career, and other technical training, the benefits are believed to include increased job/career knowledge, safer work behaviors, increased competence when dealing with high risk occupational situations, and reduced incidence of occupational injuries and illnesses" (Schulte, Stephenson, Okun, Palassis, & Biddle, 2005, p. 404).

The National Children's Center for Rural and Agricultural Health Safety Fact Sheet (2014) noted that more than 955,400 youth lived on farms in 2012 and almost half (49%) worked on the farm. In 2012, there were 258,800 non-resident youth who were hired in the agricultural industry, which was an increase from the 230,400 in 2009 (NCCRAHS, 2014). As a result, "young agricultural production workers were three times more likely to die on the job than their non-agricultural counterparts" (Hard, et al., 1993; Reed, Browning, Westneat, & Kidd, 2006, p. 314). Though the agricultural industry can be a very hazardous place to work, even more so for the youth of today, can the number of accidents can decrease with the impact of safety training education through agricultural science classes?

Conceptual/Theoretical Framework

Dahodwala, Khorajia, Champa, and Pirani (2009) noted that "pedagogy is the science and art of education. It ranges from the full development of the human being to skill acquisition. In correlation with those instructive strategies, the instructor's own philosophical beliefs of instruction are harbored and governed by the pupil's background knowledge and experience, situation, and environment, as well as learning goals set by the student and teacher" (p. 1). Pedagogy guided this study by understanding how agriculture teachers educate students concerning proper safety skills. Along with pedagogy, this study also utilized the Health Belief Model. The Health Belief Model (Rosenstock, 1974; Becker, Drachman, & Kirscht, 1974) is a psychological model that attempts to explain and predict health behaviors. This is done by focusing on the attitudes and beliefs of individuals. "In the case of agricultural safety, this dimension refers to the individual's perception of getting into an accident" (Anderson, Velez, Anderson, 2014, p.11).

Methodology

The purpose of this study was to measure and understand the impact of safety education on high school agricultural mechanics students taught by Texas agricultural science teachers.

1. What safety education have students received from their agricultural science teacher while enrolled in school-based agricultural mechanics courses in Texas?

2. Does safety education influence these student's decisions to wear Personal Protection Equipment while working at school, home, or at their work?

The population for this study were Texas agricultural mechanics students (N = 76) who participated in the 2016 Sam Houston State University Welding and Metal Fabrication contest. A survey was developed based upon a review of literature of safety education in public schools. A panel of experts (N = 5) reviewed the survey for face and content validity. A survey type questionnaire was used to gather information about the participants, their safety habits, and the perceptions students had on agricultural safety education. Due to no existing population being available for a pilot test, a post hoc analysis of reliability was conducted (Cronbach's alpha coefficient =.84). Data was analyzed based upon measures of central tendency using IBM SPSS Statistics 22.

Findings

The majority of the participants were: White (n = 54; 71.1%); Male (n = 71; 93.4%); in the 12th grade (n = 29; 38.2%); 17 years of age (n = 29; 38.7%), and attended a 3A size high school (n = 23; 31.5%). These students had an afterschool job (n = 53; 73.6 %) and used the skills learned in agricultural education courses in their current part-time position (n = 53; 80.3%). Results indicated that participants were required to take a safety exam (n = 68; 89.5%), pass with a 100% success rate (n = 52; 70.3%), and were required to wear safety glasses (n = 76; 100.0%). Furthermore, students (n = 69; 90.8%) also indicated that they would wear safety glasses even if not required. Almost a fifth (n = 14; 18.4%) of students received an injury while working in the agricultural mechanics laboratory that required treatment at school and 13.3% (n = 10) received injuries that required off-campus medical treatment.

Conclusions, Implications, & Recommendations

Participants were mainly 17 years of age males, who attended a 3 A size high school and were in the 12th grade. Additionally, the majority of respondents indicated they had a job and used safety education learned in school at their job. Additionally, most students indicated having received safety education across 31 competencies. Based upon the results of this study, several implicative questions arose: 1. How effective was the safety education of these students who are enrolled in the agricultural mechanics course at their school? 2. Did the safety perceptions of the students exist prior to enrolling in an agricultural mechanics course or did safety education influence the students? 3. What teaching methods were used to teach these safety topics to students in their agricultural mechanics courses? These questions and others are grounds for additional safety research within agricultural education. Due to high teacher turnover within agricultural education, researchers recommend teacher educators study, and if necessary, implement various methods to prepare novice teachers in the curriculum area of safety education to avoid student safety accidents and injury in agricultural education laboratories.

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