

**Injuries and Other Accidents Sustained In An Agricultural Mechanics Laboratory by Iowa
Secondary Agricultural Education Students**

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Introduction

Agricultural mechanics courses have been popular in secondary agricultural education programs for many years and continue to be (Burris, Robinson, & Terry, 2005). One of the reasons that agricultural mechanics draws so much interest is the substantive amount of time spent in an agricultural mechanics laboratory learning hands-on skills (Hubert, Ullrich, Lindner, & Murphy, 2003). The incorporation of laboratory-based experiences allows opportunities for students to engage in scientific inquiry and Science, Technology, Engineering, and Math (STEM) based projects (McKim & Saucier, 2013). By incorporating laboratory-based experiences for students, teachers must become more attentive to student safety concerns.

Agricultural mechanics laboratories are inherently a dangerous learning laboratory because of the age and experience level of the learners being introduced to the operation of power mechanics machinery (Dyer & Andreasen, 1999; Shultz, Perry, Byrd, & Anderson, 2012). The agricultural educators' most important role in agricultural mechanics instruction is to ensure that student safety is a top priority (Dyer & Andreasen). The purpose of this study was to identify the injuries and accidents sustained by secondary students within an agricultural mechanics laboratory during their teaching career.

Theoretical Framework

The theoretical framework that guided this study was the disaster theory (Downer, 2010). Furthermore, Turner (1978) found that a series of man-made disasters presented warning signs, that if acted upon, could have been averted. Turner's findings suggest that social implications superceded engineering problems, thus indicating that disasters could have been avoided. Since students tend to live in a risk-taking world with disregard to rules, they are more apt not to know and understand the consequences of unsafe behaviors (Hubert et al., 2003); unfortunately injuries have occurred in agricultural mechanics laboratories that could have been avoided.

Methodology

The research objectives for this study included: (1) Determine selected personal, professional, and program demographic characteristics of Iowa secondary agricultural education teachers who instruct in and manage agricultural mechanics programs; (2) Determine the frequency of student injuries as reported by Iowa Agricultural Education teachers over the course of their teaching careers, and (3) Determine the source of medical attention provided to the students who were injured over that timespan. The data collection instrument developed by Johnson, Schumacher, and Stewart (1990), modified by Saucier, Terry, & Schumacher (2009) and further modified by McKim and Saucier (2012) was used for data collection in this study. A three-section instrument was utilized in the overall study, the second and third section was used to address the research questions of this study. The first section of the instrument consisted of 33 statements with double-matrix response scales. The double-matrix required subjects to respond to each statement twice. The second section of the instrument was used to identify personal,

professional, and program characteristics of the respondents and the agricultural education programs in which they taught. The third section of the instrument was used to collect the types of injuries, the frequency of injuries and the medical attention rendered. Dillman's (2007) electronic data collection protocol was followed for this study. After five points of contact, a response rate of 49% ($n = 72$) was obtained. Non-response error was a relevant concern; therefore, procedures for handling non-respondents as outlined as *Method 1* in Lindner, Murphy, and Briers (2001) were followed by comparing early to late respondents.

Results/Findings

Results indicated that the teachers spent on average 7.48 hours per week supervising students in the agricultural mechanics laboratory, the average class size was 13 students, the average size of the laboratory was 2,403 ft², and the average age of these facilities was 36 years. Seventy-three percent of respondents have received first aid training. Additionally, respondents indicated that in their career, they encountered the following types of student injuries: 45.8% lacerations, 42.7% burns, 28.1% abrasions, 11.5% eye injuries, 14.6% slips/trips/falls, 1% muscle sprains/strains, 2.1% crushed appendages, 1% severed appendages, and no hearing injuries or broken bones. The most commonly occurring injury in the agricultural mechanics laboratory were lacerations ($n = 40$), closely followed by burns ($n = 38$).

Conclusions/ Implications/Recommendations/Impact on Profession

The 72 agricultural education teachers reported on average less than two minor student injuries that did not require the students to leave the school for medical attention over the course of the 2013-2014 academic school year. Only three major injuries requiring medical attention were reported. The low number of major injuries reported per teacher indicated that the teachers are putting student safety as a top priority, which is supported by the findings of Shultz, Anderson, Shultz, and Paulsen, (2014) that safety is the most important topic taught in agricultural mechanics. Over an entire career, teachers noted that there were eleven eye injuries reported, this leads the researchers to question if those injuries could have been avoidable by wearing safety glasses. This could align to the suggestions of the disaster theory (Downer, 2010) that those injuries could have been avoidable. The researchers recommend that agricultural education teachers should continue to model and enforce safe work habits. The agricultural education teacher administered some level of medical attention for 110 of the 117 accidents, which further indicates the importance in assuring the teachers should be prepared to administer first aid. The researchers recommend that teachers receive up-to-date training administered annually at the state teachers' association meetings.

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