A comparison of the safety exposure levels of students participating in the 2003 versus 2013 Houston Livestock Show and Rodeo Agricultural Mechanics Project Show: Are students more safe 10 years later?

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Introduction/ Conceptual Framework

- U.S. agricultural education uses a **three-circle model** (National FFA Organization, 2014).
- These three components consist of **classroom/ laboratory instruction, the FFA, and Supervised Agricultural Experience projects (SAE)**.
- School-based agricultural education programs offer many **unique hands-on opportunities** for students (Hubert, Ullrich, Lindner, & Murphy, 2003).
- **Agricultural mechanics** classes continue to be one of the **most popular** curriculum choices for agriculture students today (Hubert & Leising, 2000; Perry, Williams, & Anderson, 2012).
- School personnel assume the **responsibility** of providing an **accident free environment** for the learner (Gliem & Miller, 1993).
- Agricultural education laboratories have found that these environments can have **potential safety hazards** relating to **noise** (Miller & Schimpp, 1993), **ventilation** (Madou-Bangurah, 1978), and **student and teacher attitudes regarding safety** (Laird & Kahler, 1995; Lawver & Fraze, 1995).
- Additionally, students may be exposed to many different tools and materials, some of which are **potentially hazardous** to their **health** or could cause **serious injury** — including **death** (Johnson & Fletcher, 1990).
- In Texas,15.4% of Texas agricultural science teachers reported that they **do not require students to wear safety glasses** or proper personal protection equipment (PPE) while working in the laboratory during **hazardous conditions** (Perry, Williams, & Anderson, 2012).
- In **teacher preparation programs** across the U.S., agricultural mechanics is a **critical component** in the preparation of new teachers for **classroom/laboratory instruction**. (Burris & Robinson, 2005).

Methodology

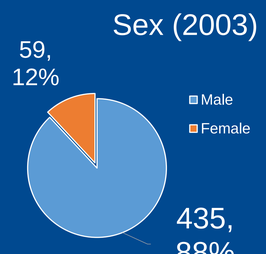
- The purpose of this **census** was to understand **the safety education** provided to the 2013 Houston Livestock Show and Rodeo Agricultural Mechanics Project Show participants (HLSRAMPS; *N* = 632) and compare those results from 2003 The instrument was judged to be **valid** (panel of experts = 5).
- Data was collected via a booklet-style **survey** with **two sections** (demographics and safety education).
- **Age specific questions** were offered to the respondents.
- Due to only demographic type questions, **reliability** was of minimal concern
- Data was collected from each student during the 2013 HLSRAMPS; **response rate of 100%.**
- Data was analyzed using IBM SPSS 22.0

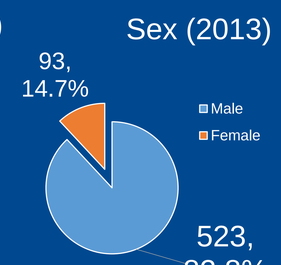
Top 3 Increases and Top 3 Decreases of Safety Education

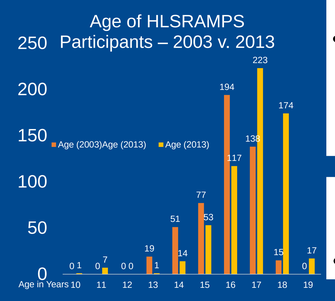
Table 1
2003 vs. 2013 HLRAMPS participants safety education exposure and comparisons (2003 – *N* = 494 and 2013 – *N* = 632)

Factors	2003 Yes (%)	2013 Yes (%)	*Δ* Yes (%)
Top 3 Increases			
When working in the agricultural mechanics laboratory, were you **required to wear ear protection?**	109 (22.06)	434 (68.70)	325 (+46.64)
My **teacher** has **conducted tool safety demonstrations?***	259 (52.43)	580 (91.77)	321 (+39.64)
When working in the agricultural mechanics laboratory, were you **required to wear eye protection?**	285 (57.70)	598 (94.60)	313 (+36.90)
Top 3 Decreases			
Have you **received CPR instruction?**	470 (95.14)	279 (44.10)	-191 (-51.04)
Were you provided or presented material on **greenhouse safety?**	451 (91.30)	297 (47.00)	-154 (-44.30)
Are your **safety exams kept on file at school?**	469 (94.94)	482 (76.30)	13 (-21.64)

Note. * denotes an average safety education exposure to hand and stationary power tool safety demonstration (summated variable)







Results

- Analysis revealed that students had **more positive levels** of **safety education exposure** in Texas agriculture classrooms in **2013 than in 2003**.
- The **top three increases** in student exposure to safety education were in the following categories: *hearing protection was required when working in the agricultural mechanics laboratory* (*Δ n* = 325; 46.64%), *teacher conducted tool safety demonstrations* (*Δ n* = 321; 39.64%), and *eye protection was required when working in the agricultural mechanics laboratory* (*Δ n* = 313; 36.90%).
- The **top three decreases** in student exposure to safety education were in the following categories: *CPR instruction* (*Δ n* = -191; -51.04%), *green house safety* (*Δ n* = -154, - 44.30%), and *student safety exams are kept on file at school* (*Δ n* = 13; -21.64%).
- Overall, students received **more safety education exposure** in **11 of 18 competencies** as measured by the instrument.

Conclusions/ Implications/ Recommendations

- The majority of participants in the 2013 study received more safety education exposure than students in 2003.
- However, the **majority of students** surveyed **did not receive CPR** instruction by their agriculture teacher. Additionally, the majority of students did not witness nor receive injuries in the agricultural education laboratory that required on or off campus medical treatment.
- Are agricultural science teachers certified in CPR? If yes, then why do they not instruct CPR to their students? Should teacher education programs require that all new teachers be CPR certified? Based upon the large number of students who were injured in agricultural education programs, should these laboratories be inspected for safety?
- Researchers recommend that all **agricultural education laboratories be investigated to ensure that a safe learning environment** is established for all students.
- Additionally**, professional development programs** should be established for all agriculture teachers who supervise student work in agricultural education laboratories - **especially CPR training.**

References

- Available upon request