

Supervisor Involvement and Professional Development Needs Associated with SAE Programming and Safety

Rebecca G. Lawver¹, Michael L. Pate², and Tyson J. Sorensen³

Abstract

This descriptive survey research study sought to gather evidence of school-based agriculture teachers' perceptions of community supervisor involvement with supervision and planning of students' Supervised Agricultural Experience (SAE) work activities and safety training professional development needs. Responding teachers indicated they agreed to strongly agreed that secondary agricultural education teachers were highly involved in planning (90.5%, $f = 208$), student SAE projects but were in less agreement that parents (57.6%, $f = 133$), and employers (45.0%, $f = 104$) were highly involved in planning students' SAE projects. Teachers were more in agreement that parents (62.6%, $f = 144$) and employers (68.8%, $f = 159$) were highly involved in supervising students' SAE projects. The professional development topic with the lowest level of agreement (58.5%) was preparing safety guidelines for SAE programs. Other safety related professional development topics of interest from teachers included chain saw safety, greenhouse safety, ladder safety, and processing equipment. Agricultural education professionals should implement community outreach seminars and curriculum to support teachers' professional development in engaging community stakeholders to assist teachers with improving safety conditions for student workers. Additional professional development may be dedicated to technical safety training targeted for specific production agriculture hazards. Recommendations for further research are discussed.

Keywords: Professional Development, SAE, Supervision, Safety, School-based Agriculture Teacher

Introduction

Supervised Agricultural Experiences (SAE) are historically tied to agricultural education and considered a crucial component of the school-based agricultural education model (Croom, 2008; National FFA, 2015; Phipps, Osborne, Dyer, & Ball, 2008). In fact, most agriculture teachers believe SAE projects should be required by every agricultural education student (Croom, 2008). SAEs are philosophically designed to provide guided experiential learning beyond typical school hours (Phipps et al., 2008). The learning activities of SAEs are to be planned intentionally to develop students' skills and abilities to culminate toward a career in agriculture (Barrick et al., 1992). However, because students often perform SAE activities outside of school hours – and therefore outside the direct supervision of the local agriculture teacher – the welfare and safety of the students carrying out SAE activities may be at risk. This is especially true when SAE activities involve potentially hazardous situations or when inadequate supervision or training is provided.

¹ Rebecca G. Lawver is an Assistant Professor in the School of Applied Sciences Technology and Education at Utah State University, 2300 Old Main Hill, Logan, UT 84322, Rebecca.lawver@usu.edu.

² Michael L. Pate is an Assistant Professor in the School of Applied Sciences Technology and Education at Utah State University, 2300 Old Main Hill, Logan, UT 84322, Michael.pate@usu.edu.

³ Tyson J. Sorensen is an Assistant Professor in the School of Applied Sciences Technology and Education at Utah State University, 2300 Old Main Hill, Logan, UT 84322, Tyson.sorensen@usu.edu

Furthermore, parents and employers, often act as community supervisors to students more frequently than the local agriculture teacher and may have a greater influence on students' SAE activities and behavior than the agriculture teacher. This study sought to describe community supervisor involvement with SAE and the professional development needs of agriculture teachers related to SAE safety.

With youth safety being the underlying focus of this study, we sought to collect data from SAE programs in which a greater risk to students' welfare and safety might exist. Therefore, SAE related to production agriculture were targeted for this research study. While many student SAEs are not exclusively production based, many today still are. Agriculture teachers must be aware of the safety surrounding student work in production agriculture, particularly if it is part of their SAE. There are a number of SAE programs based on production agriculture practices as outlined in the National FFA Proficiency Award program (National FFA, 2015). Additionally, the American FFA Degree award is presented to approximately 3,500 students per year, most for having high quality production agriculture SAE programs (National FFA, 2014b).

Production agriculture had the second highest injury rate of workers between the ages of 15 and 24 years old of any industry employing youth (Estes, Jackson, & Castillo, 2010). In an effort to improve the safety of young workers, changes of child labor laws in agriculture were proposed in 2011 by the United States Department of Labor (DOL). Ultimately, these proposed changes were withdrawn by the DOL, but the concern about safety of young workers still exists today. Currently, agricultural education students under the age of 16 working in a production-based SAE are provided with employment exemptions based on the Fair Labor Standards Act (FLSA). However, these exemptions explain that student-learners in a "bona fide vocational agricultural program" under strict conditions may be revoked of the exemption status in any individual situation if "reasonable precautions" have not been observed for the safety of minors employed (DOL, 2007, p. 5-6). SAEs, as an entrepreneurial or placement type, often require students to work alongside parents or employers. However, while parents or supervisors are busy with their own work responsibilities they may inadvertently expose students to safety or injury risks. Considering the potential for injuries due to the nature of production agriculture and the number of students engaged in a production related SAE, there is a need to address the supervision and safety training of agriculture students by agriculture teachers, parents and / or employers.

Literature Review

The need for greater engagement between teacher educators and school-based agriculture teachers on issues associated with SAEs has long been documented in agricultural education research (Dyer & Osborne, 1995; Graham & Birkenholz, 1999; Retallick & Martin, 2008; Wilson & Moore, 2007). Roberts and Dyer (2004) identified development of SAE opportunities for students was one of the highest professional development needs for school-based agriculture teachers. However, there is little information about teachers' professional development needs in technical content areas to ensure students are utilizing safe practices during SAE activities.

Providing adequate supervision of students has been identified as the greatest responsibility of school-based agriculture teachers (Swortzel, 1996). Swortzel (1996) found teachers strongly agreed they should supervise students' SAE programs throughout the year and agreed supervision was most effective when making on-site supervisory visits. However, SAE program supervision may overwhelm teachers, considering there are an estimated 610,240 agricultural education students with only about 11,000 school-based agriculture teachers and FFA advisors nationwide (National FFA, 2014a). This means that if every student were to have an SAE, each agriculture teacher would be responsible for the supervision of SAE for over 55 students. Additionally, the literature in agricultural education overwhelmingly supports the notion that agriculture teachers work long hours trying to meet the demands of the agricultural education profession (Mundt &

Connors, 1999; Torres, Lawver, & Lambert, 2009), part of which includes the planning and supervision of student SAE activities.

To assist with SAE planning and supervision, Phipps et al. (2008) recommended teachers work in collaboration with parents/guardians, employers and other adults in the development and achievement of students' SAE educational and career goals. Schwebel and Gaines (2007) identified that one of the most important behavioral factors in preventing injuries to youth was primarily related to supervision provided by parents or adults serving "*in parentis*" such as teachers. The degree of active supervision was defined by the level of proximity, attention and continuity provided by the responsible adult (Schwebel & Gaines, 2007). Pryor, Caruth, and McCoy (2002) reported that half of all injured youth were being supervised by an adult who was actively conducting work at the same time which highlighted the reality that supervision could not be provided to the level that youth farm workers needed while working in a hazardous environment (Morrongiello, Zdzieborski, & Steward, 2012).

One main purpose of this study was to identify agriculture teachers' perceptions of community supervisor involvement. This was because of little evidence is available on the amount of engagement that community stakeholders have with student SAE programs. We specifically sought to identify the engagement level of community stakeholders in an effort to address the issue of SAE safety for youth.

To ensure that SAE remains a crucial component of the school-based agricultural education program, the safety of students involved in SAE activities must not be compromised. Therefore, it is imperative to identify planning and supervision strategies utilized by community supervisors and agriculture teachers for student SAE programs. Furthermore, it is important to determine the perceived professional development needs related to student SAE safety of school-based agriculture teachers in order to develop relevant professional development training for preventing agricultural injuries to students engaged in production based SAE programs.

Theoretical Framework

The theoretical framework for this study was grounded in the social ecological theory (Bronfenbrenner, 1977). The social ecological theory was developed as a model for helping to understand the factors effecting human behavior and development, but also a framework for developing programs through social environments. The theory serves as an important lens for this research because it not only provides a context for understanding the factors influencing youth safety behavior but also provides a framework for intervention or social programming regarding the safety of students involved with SAE programs.

The social ecological theory proposes that human behavior is influenced by numerous other systems and groups (Wandersman et al., 1996). Brofenbrenner (1977) described those systems in a hierarchal arrangement from individual to macrosystem (society). Over time, as this theory has been applied in various disciplines, more specific terms have been utilized to describe the levels which include individual, interpersonal, organizational, community and public policy (see Figure 1) (McLeroy, Bibeau, Steckler, & Glanz, 1988). The social ecological theory also suggests behavior change requires activities that target these multiple levels of influence (Emmons, 2000).

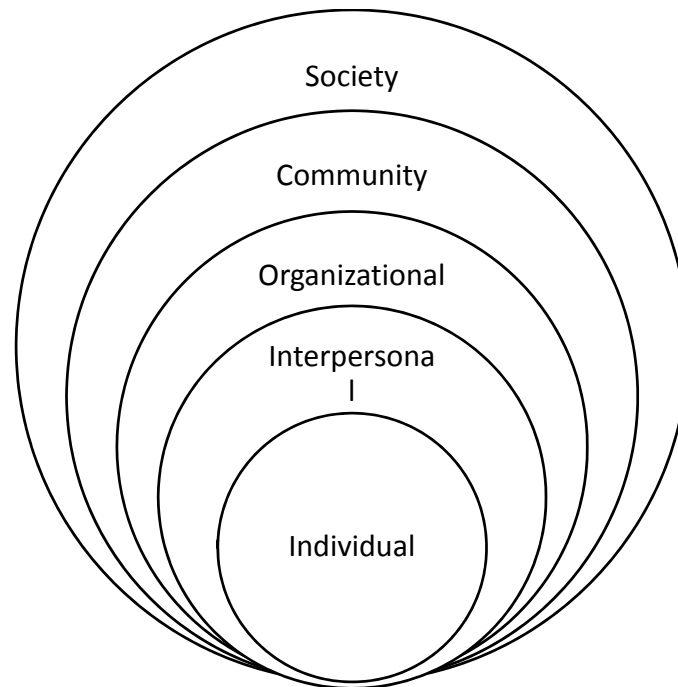


Figure 1. The social ecological theory (Bronfenbrenner, 1977; McLeroy, Bibeau, Steckler & Glanz, 1988).

According to the social ecological theory, at the smallest social level, individual factors can influence a person's safety behavior. Research shows that unsafe behaviors of youth are often attributed to factors such as an individual's attitude, perceptions, and/or lack of knowledge (Daugherty, 1999; Mosher, Keren, Freeman, & Hurlbugh, 2012).

Interpersonal factors, such as relationships with family, friends, and teachers also play an influential role in the safety behavior of a person (McLeroy et al., 1988). In agriculture, children often learn safety behaviors and attitudes by working alongside family, friends, or other mentors. Sanderson, Dukeshire, Rangel, and Garbes (2010) concluded that as children progress to young adults they develop clear ideas about how to farm safely through a process called "farm apprentice" which involves observational learning and modeling of mentors. Due to this farm apprentice phenomena, Sanderson et al. (2010) reported agricultural college students described themselves as being exposed to dangerous activities at an early age but believed they had the capacity to control injury risks.

Therefore, at the interpersonal level, teachers, parents, and employers all play critical roles in preventing injuries through their own actions which are modeled by youth during their learning experiences (Schwebel & Gaines, 2007). Examining SAE supervision and planning through this theoretical lens, we hypothesize that community supervisors' beliefs and behaviors may influence students' beliefs and as their safety behavior while performing work related to SAEs.

At the organizational level, youth spend a large portion of their time at school. Therefore, the school organization can have a significant influence on safety behaviors of youth. The school environment and the local agriculture program can provide a context for appropriate safety behavior. School-based agriculture teachers play a vital role in protecting the safety of youth through providing safety-related rules and assisting youth in developing logical thinking for decision making (Schwebel & Pickett, 2012). However, agriculture teachers may feel little control over injury prevention in SAEs. This may stem from feeling unprepared to develop or being able to provide content-specific training to students and supervisors for reducing injury risks. Therefore,

research that identifies agriculture teachers' needs in the area of SAE safety can be important in protecting the safety of their students.

According to the social ecological theory, the community also influences human behavior. For example, community resources (or the lack thereof), such as accessibility and affordability of educational opportunities, can enable youth and their parents to learn and implement safety behaviors in their various agricultural activities, including SAE planning and execution. Furthermore, the availability and accessibility of community supervisors to be involved in the planning and implementation of SAE are factors of the community that may influence students' safety behavior when completing SAE related activities.

Finally, public policy can influence the safety behavior of individuals through regulatory channels at the local, state, and national level. One example is child labor laws prohibiting youth of specific ages from working in potentially unsafe occupations such as agriculture.

The social ecological theory serves as an overarching model for social programming but does not provide a conceptual framework for specific interventions. Using the social ecological model as a theoretical lens, we adopted the Haddon matrix as a conceptual framework for exploring interventions (teacher professional development training needs).

Conceptual Framework

The Haddon matrix defines the injury experience and how to engage in developing interventions. This is one of the most commonly used models in the injury prevention field to develop and evaluate safety interventions (Runyan, 1998). In general, prevention includes a wide range of activities — known as “interventions” — aimed at reducing risks or threats to health. Interventions can be evaluated to focus on specific factors; either on the host (student), agent/vehicle/vector (agricultural equipment or livestock), physical environment (work place), or social environment (employer or parental safety attitudes) within each stage of the injury. Figure 2 provides a graphical representation of the Haddon matrix (Runyan, 1998).

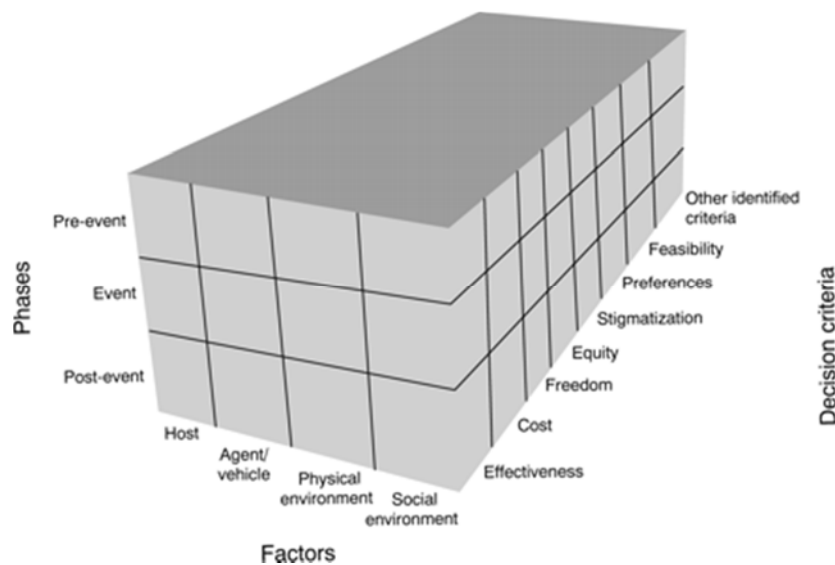


Figure 2. Proposed three-dimensional Haddon matrix. From “Using the Haddon matrix: Introducing the third dimension,” by C. W. Runyan, 1998, *Injury Prevention*, 4, p. 304. Copyright 1998 by BMJ Publishing Group Ltd. Reprinted with permission.

Within the Haddon matrix injury interventions are classified into three phases, namely primary (pre-event), secondary (event), and tertiary (post-event) (Haddon 1980, 1999). The primary or pre-event stage interventions seek to prevent the agent from reaching the host such as reducing exposure to hazards. The planning and teaching of safety within SAEs would be situated within the pre-event stage. Secondary or the “event” stage interventions involve limiting the interaction of the agent forces and the host. A specific example of this would be students incorporating personal protective equipment in their SAE activities. Tertiary or post-event interventions involve minimizing the damage once damage has been done to the host, such as shorter emergency response time for medical attention. Finally, Runyan (1998) offered a third dimension to the Haddon matrix described as “decision criteria” to evaluate the implementation of intervention strategies.

For the purposes of this study, the Haddon matrix lens was used to examine supervisor involvement in SAE (social environment factors) and the professional development needs of agriculture teachers within the three intervention phases of injury prevention. Using this conceptual framework, we propose that by describing agriculture teachers’ SAE safety professional development needs and perceptions of supervisors’ involvement in planning and supervising student SAE activities, it will allow identification of intervention strategies. The intervention strategies then may be based on what the teachers value and the feasibility of community supervisors and teachers implementing intervention strategies for SAEs.

Purpose/Objectives

The purpose of this study was to gather evidence of school-based agriculture teachers’ perceptions toward community member involvement with supervision and planning of student’s SAE work activities and SAE safety professional development needs. Exploring agriculture teachers’ perceptions of SAE safety professional development needs and supervisor involvement with SAE activities aligns with the American Association of Agricultural Education National Research Agenda Priority 4. Accordingly, a primary area of scientific focus is to “Deepen our understanding of effective teaching and learning processes in all agricultural education environments” (Doerfert, 2011, p. 18). Determining the SAE safety professional development needs of agriculture teachers can provide state staff with valuable information to provide in-service and pre-service training to agriculture teachers related to SAE safety planning and supervision to positively influence the teaching and learning process of SAEs. Identifying how supervisors are involved in student SAE activities will provide professionals with information that can improve student safety and increase teaching effectiveness and student learning within the SAE environment. The following research objectives guided this study:

- Describe selected demographic characteristics of school based agriculture teachers and student SAEs.
- Describe school-based agriculture teachers’ perceptions of supervisor involvement with supervising and planning students’ SAEs.
- Identify school-based agriculture teachers’ perceived professional development needs related to SAE planning, supervision and safety.

Methods/Procedures

As a descriptive survey research project, we sought information on teachers’ perceptions of community member involvement with SAE supervision and safety professional development needs of school-based agriculture teachers across the United States. This research was reviewed and approved under Utah State University IRB protocol #4704. In the fall of 2013, secondary agriculture education teachers registered as advisors with the National FFA organization were

surveyed utilizing the Qualtrics Survey Platform. An online survey instrument was created and distributed to the participants to collect descriptive data regarding their perceptions of supervisor involvement in planning and supervising student SAE projects and teachers' professional development needs relevant to SAE safety.

Instrument

The survey instrument was designed and distributed to a random sample of agriculture teachers in the United States using the online survey system Qualtrics. The survey was developed from the *National Children's Center for Rural and Agricultural Health and Safety Guidelines for Hired Adolescent Farm Workers* (Fisher, Miller, Mulhern, & Lee, 2009) and the *Child Labor Requirements in Agricultural Occupations under the Fair Labor Standards Act* (Child Labor Bulletin 102, 2007). The instrument was broken into two major parts. Part one consisted of questions to identify teachers' perceptions of supervisor involvement with SAEs as well as teachers' perceived professional development needs regarding SAE safety. Part two of the instrument included items identifying demographics of school-based agriculture education teachers.

A total of six supervisor questions were developed from the Child Labor Bulletin 102 (2007) to describe teachers' perception of stakeholder involvement with supervision and planning of student SAE work activities. Participants were asked to indicate their perceived level of agreement regarding the level of involvement in SAE supervision and safety planning using a summated rating scale: 5 = "Strongly Agree", 4 = "Agree", 3 = "Neutral", 2 = "Disagree" and 1 = "Strongly Disagree." Sample items included "Secondary agriculture teachers are highly involved in the planning of their students SAE programs," and "Parents/guardians are highly involved in the supervision of their student(s) while completing SAE work responsibilities."

Professional development questions were developed from Fisher et al.'s (2009) safety training priorities for young workers in agriculture to identify teachers' perceived need for training in supervision and safety strategies to keep working youth safe in agriculture. Participants were asked to indicate the extent with which they agreed secondary agriculture teachers needed professional development training in specific areas related to SAE supervision and safety planning. We utilized a summated rating scale: 5 = "Strongly Agree", 4 = "Agree", 3 = "Neutral", 2 = "Disagree" and 1 = "Strongly Disagree." Sample items (areas of perceived professional development training) included "Increasing community agribusiness' involvement in supervising SAE programs," and "Preparing supervision plans to ensure student safety."

A panel of five university agricultural education teacher educators with expertise in survey methodology, experiential learning, agriculture safety, and supervised agricultural experiences reviewed the survey instrument for face and content validity and determined the instrument to be sufficiently valid. The survey instrument was pilot tested with members from Region I of the National Association of Agricultural Educators. A test-retest was conducted to determine the coefficient of stability for survey items. A total of 15 pre-service teachers enrolled in an SAE and FFA course were asked to complete the survey and then were asked to complete the survey a second time one week later. Intraclass correlation coefficients are recommended to examine test-retest reliability of an instrument (Yen & Lo, 2002; Bartko, 1991). Teachers' perceptions of supervisor involvement with SAEs yielded an intraclass correlation coefficient of 0.53, which is considered to be "fair" (Cicchetti, 1994), and teachers' professional development items yielded a coefficient of 0.84, which is considered to be "excellent" (Cicchetti, 1994). It was assumed that demographic questions did not elicit demands for considerable time, thought, nor variation and therefore was considered to pose no reliability risks (Dillman, 2000). We assumed the instrument to be reliable.

Participants and Data Collection

The National FFA Local Program Success Specialists were asked to provide a random sample of current school-based agriculture teachers with email and telephone contact information from each of the four regions of the National FFA. The appropriate sample size was determined based on Krejcie and Morgan's (1970) sample size determinant formulas. According to the National FFA Organization, there were over 11,000 agriculture teachers in the United States when the study was conducted (National FFA Organization, 2013). Accordingly, a sample size of 372 was required to fully generalize to the entire population. This study targeted a simple random sample from the entire population of secondary agriculture teachers in the United States. A sample frame of 1349 school-based agriculture teachers was obtained from the National FFA Organization consisting of names, telephone numbers, and email addresses.

Teachers were asked to complete the instrument at the end of the 2013 calendar year prior to beginning the 2014 academic spring semester. Five points of contact were attempted during the survey (Dillman, 2007). These five points of contact included a pre-notice email, invitation email to participate in the survey, and three follow-up email reminders to non-respondents. There were 141 individuals that were either no longer teaching or their contact information was no longer correct, resulting in an accessible sample of 1208. A total of 263 surveys were returned with 232 surveys complete and useable, for a response rate of 19.2%. Follow-up emails were sent within two weeks of each other.

To account for non-response error in this study, the early respondents were compared to the late respondents. This method of controlling for non-response error is based on the concept that late respondents are similar to non-respondents (Armstrong & Overton, 1977). Lindner, Murphy, and Briers (2001) recommended that late respondents be defined as "those who respond in the last wave of respondents in successive follow-ups to a questionnaire, that is, in response to the last stimulus" (p. 52). Lindner et al. (2001) recommended making telephone calls to non-respondents to collect specific data (SAE professional development needs, gender, age, region affiliation) to compare with on-time respondents. Therefore, follow-up telephone interviews were conducted over a four week period. We attempted to contact a random sample of 300 non-respondents. A total of 62 individuals completed the telephone follow-up survey and were included as usable surveys ($n = 232$). Non-response bias was checked by comparing on-time respondents to those individuals contacted in the follow-up telephone call ($n = 62$) (Linder et al., 2001). All statistical tests were set at an alpha level of .05 *a priori*. There were no statistically significant differences between online respondents and non-respondent on SAE professional development needs ($t(229) = 0.303, p = .76$), gender ($\chi^2(1) = .860, p = .354$), age ($t(229) = 0.22, p = .82$), and FFA regional affiliation ($\chi^2(4) = 5.518, p = .24$).

Data Analysis

IBM SPSS version 20 was used for data analysis. All three research objectives were analyzed descriptively with frequencies and percentages, means, and standard deviations. For items where the standard deviation exceeded the mean, the median (*Mdn*) and interquartile range (*IQR*) were reported. The median is a more appropriate central tendency and interquartile range is a more appropriate measure of variability when there is a skewed distribution caused by outliers (Harris, 1998). We ranked teachers' perceived professional development needs related to SAE supervision and safety planning by identifying the items with the highest percentage of strongly agree and agree statements selected.

Results/Findings

Research objective one sought to describe selected demographic characteristics of agriculture teachers and student SAEs. The average age of school-based agriculture teachers completing the survey was 41 years old ($SD = 11.1$). The majority of respondents (62.9%, $n = 144$) self-identified their gender as male. Over half of the respondents (56.5%, $n = 130$) indicated having completed a master's degree program at the time of the survey. The majority of responding teachers (65.2%, $n = 150$) indicated they represented a single teacher program. For the number of students enrolled in respondents' programs the median was 100 ($IQR = 98$). For the number of students enrolled with an active approved SAE in respondents' programs the median was 50 ($IQR = 70$). A total of 122 respondents (54.2%) indicated the most commonly completed SAE type was placement followed by 101 respondents (45.5%) who indicated entrepreneurship was the most commonly completed SAE type in their program. Two participants indicated having no students with an approved active SAE project. The most commonly taught agriculture course, where agricultural safety training could be integrated, was "animal science" (81.0%, $f = 188$) followed by "agricultural science" (76.3%, $f = 177$). There were 80 respondents (37.4%) from the central FFA region, 50 (23.4%) respondents from the eastern FFA region, 41 (19.2%) respondents from the southern FFA region, and 41 (19.2%) respondents from the western FFA region. Two individuals chose not to identify an FFA region affiliation.

Research objective two sought to describe school-based agriculture teachers' perceptions of involvement in SAE supervision and safety planning. Agriculture teachers were asked to indicate the extent with which they agreed SAE supervisors were highly involved in planning and supervising their students' SAE programs. Table 1 provides agreement frequencies for each item. The table is arranged in rank order by frequency of responses to strongly agree and agree. Regarding SAE planning, the majority of responding teachers indicated they agreed or strongly agreed that secondary agriculture teachers are highly involved in planning (90.5%, $f = 208$) and supervising (73.5%, $f = 169$) student SAE projects. Over half of the respondents (57.6%, $f = 133$) agreed or strongly agreed that parents are highly involved in planning students' SAE projects. Less than half of responding teachers (45.0%, $f = 104$) agreed or strongly agreed that employers were highly involved in planning students' SAE projects. Regarding SAE supervision, two-thirds of responding teachers (62.6%, $f = 144$) agreed or strongly agreed that parents were highly involved in supervising students' SAE projects. Over two-thirds of responding teachers (68.8%, $f = 159$) agreed or strongly agreed that employers were highly involved in supervising students' SAE projects.

Table 1
Respondents' Perceptions of Supervisor Involvement in SAE Supervision and Planning

	<i>SD</i>	<i>D</i>	<i>N</i>	<i>A</i>	<i>SA</i>
Supervisor Involvement Items	<i>f</i> (%)	<i>f</i> (%)	<i>f</i> (%)	<i>f</i> (%)	<i>f</i> (%)
Secondary agriculture teachers are highly involved in the planning of their students SAE programs (<i>n</i> = 230)	3 (1.3%)	5 (2.2%)	14 (6.1%)	97 (42.2%)	111 (48.3%)
Secondary agriculture teachers are highly involved in the supervision of student(s) while completing SAE work responsibilities (<i>n</i> = 230)	4 (1.7%)	18 (7.8%)	39 (17.0%)	103 (44.8%)	66 (28.7%)
Employment supervisors are highly involved in the supervision of students while completing SAE work responsibilities (<i>n</i> = 231)	6 (2.6%)	14 (6.1%)	52 (22.5%)	119 (51.5%)	40 (17.3%)
Parents/Guardians are highly involved in the supervision of their student(s) while completing SAE work responsibilities (<i>n</i> = 230)	7 (3.0%)	29 (12.6%)	50 (21.7%)	118 (51.3%)	26 (11.3%)
Parents/Guardians are highly involved in the planning of their students' SAE program (<i>n</i> = 231)	6 (2.6%)	37 (16.0%)	55 (23.8%)	112 (48.5%)	21 (9.1%)
Employment supervisors are highly involved in the planning of students' SAE program (<i>n</i> = 231)	8 (3.5%)	35 (15.2%)	84 (36.4%)	85 (36.8%)	19 (8.2%)

Note. *SD* = strongly disagree, *D* = disagree, *N* = neutral, *A* = agree, *SA* = strongly agree

Research objective three sought to identify school-based agriculture teachers' perceived professional development needs related to SAE safety. School-based agriculture teachers were asked to indicate the extent with which they agreed secondary agriculture teachers needed professional development training in areas of SAE to ensure student safety (see Table 2). Teachers indicated increasing supervisor participation in planning and supervision of SAE programs as the greatest professional development needs related to SAEs while teaching and planning related to SAE safety were perceived to be lesser professional development needs among teachers.

Table 2
 Respondents' Perception of Agricultural Education Teacher Professional Development Needs
 Related to SAE Planning, Supervision and Safety

Professional Development Items	Rank	<i>SD</i>	<i>D</i>	<i>N</i>	<i>A</i>	<i>SA</i>
		<i>f</i> (%)	<i>f</i> (%)	<i>f</i> (%)	<i>f</i> (%)	<i>f</i> (%)
Increasing community agribusinesses' participation in planning SAE programs (<i>n</i> = 231)	1	1 (0.4%)	4 (1.7%)	18 (7.8%)	149 (64.5%)	59 (25.5%)
Increasing parent/guardian participation in planning SAE programs (<i>n</i> = 231)	2	2 (0.9%)	8 (3.5%)	22 (9.5%)	150 (64.9%)	49 (21.2%)
Increasing community agribusinesses' involvement in supervising SAE programs (<i>n</i> = 228)	3	1 (0.4%)	7 (3.1%)	36 (15.8%)	137 (60.1%)	47 (20.6%)
Increasing parent/guardians' involvement in supervising SAE programs (<i>n</i> = 229)	4	1 (0.4%)	10 (4.4%)	28 (12.2%)	138 (60.3%)	52 (22.7%)
Teaching safe work habits for handling livestock (<i>n</i> = 229)	5	3 (1.3%)	10 (7.0%)	33 (20.5%)	133 (52.8%)	50 (18.3%)
Teaching safe work habits for handling pesticides (<i>n</i> = 230)	6	2 (0.9%)	12 (5.2%)	36 (15.7%)	128 (55.7%)	52 (22.6%)
Teaching safe work habits for operating tractors (<i>n</i> = 231)	7	3 (1.3%)	10 (4.3%)	33 (14.3%)	130 (56.3%)	55 (23.8%)
Ensuring students develop safe work habits while completing SAE activities (<i>n</i> = 231)	8	3 (1.3%)	16 (6.9%)	25 (10.8%)	142 (61.5%)	45 (19.5%)
Teaching safe work habits for operating ATVs (<i>n</i> = 229)	9	3 (1.3%)	13 (5.7%)	39 (17.0%)	118 (51.5%)	56 (24.5%)
Teaching safe work habits for equestrian activities (<i>n</i> = 229)	10	3 (1.3%)	16 (7.0%)	47 (20.5%)	121 (52.8%)	42 (18.3%)
Preparing supervision plans to ensure student safety (<i>n</i> = 231)	11	1 (0.4%)	21 (9.1%)	42 (18.2%)	138 (59.7%)	29 (12.6%)
Preparing safety guidelines for SAE programs (<i>n</i> = 229)	12	2 (0.9%)	16 (7.0%)	50 (21.8%)	132 (57.6%)	29 (12.7%)

Note. *SD* = strongly disagree, *D* = disagree, *N* = neutral, *A* = agree, *SA* = strongly agree

Conclusions/Recommendations/Implication

The purpose of this research was to provide a national description of school-based agriculture teachers' perceptions toward supervisor involvement with SAE work activities and SAE safety professional development needs. Given the recent debate over child labor and the importance of youth safety as well as the importance of SAE within agricultural education, research exploring the level of involvement of community supervisors and the professional development needs pertaining to SAE supervision, planning, and safety of agriculture teachers is both timely and relevant. However, due to a relatively small sample size and response rate, caution should be taken when generalizing the results of this study. Despite this, research objective one provides demographic information related to SAE and school-based agriculture teachers in the United States which might provide useful in describing the agricultural education profession nationwide.

Placement-type SAE was perceived to be the most common type of SAE program completed by students as identified by the respondents. Despite this, participants did not seem to agree that employment supervisors were highly involved in the planning and SAE programs. Encouraging the involvement of community partners in supervision and safety planning is a critical component to ensuring continuation of students' ability to work safely in agriculture. State agriculture teacher associations, university teacher educators, and other agricultural education stakeholders should consider implementing community outreach seminars to support in-service teachers' ability to engage business partners and community stakeholders to improve safety conditions for student workers. Pre-service agriculture teacher development should include safety, risk assessment and skill development throughout their preparation. Thus, collaboration with other programs, departments, and local agriculture teachers is needed. It may be beneficial to implement an agricultural safety and health minor for agricultural education majors within university teacher preparation program. Land grant universities' could implement college wide professional collaborations among agricultural science disciplines to target training for specific production agriculture hazards.

To develop a culture of safety among pre-service agricultural education majors, university teacher educators and state agriculture teacher associations should consider implementing safety training into technical content programming for pre-service teachers. This could serve as a means to develop a culture of safety among students and agriculture teachers. The ecological theory recognizes that the social and cultural properties of meaning making and intelligence, and the practices of a group, are different from and greater than any one individual's behavioral habits, mental models, and individual capabilities. Therefore, in order to ensure youth safety, participation in safety training, professional development, and policy implementation at all social levels is important.

Supervisor Involvement

The second research objective sought to describe the role of community supervisors in planning and supervising student SAE programs. The teachers responding agreed community supervisors were highly involved in planning and supervising student SAE work programs. The item with the highest level of agreement among responding teachers was "secondary agriculture teachers are highly involved in the planning of their students SAE programs." The supervisor involvement item with the lowest level of agreement was "employment supervisors are highly involved in the planning of students' SAE program." This finding could be a result of the students' strong connection to the agriculture teacher and program in terms of planning. Teachers' responses suggest that most of the planning and supervising of students' SAE projects falls to the responsibility of the teacher. However, it also indicates that teachers' are highly involved with planning students' SAE projects but are less engaged in day to day supervision of students' SAE work. Being highly involved in the planning of student SAE would provide the agriculture teacher

an excellent opportunity to teach safety and risk assessment to students. This also suggests teachers should be able to effectively teach their students about safety and risk assessment when planning SAE programs. Therefore, this research which sought to identify professional development needs related to SAE safety training is important.

Responding teachers' indicated parents and employers were more involved in supervising students' SAE projects than in planning. Since parents and employers are highly involved in student supervision of SAE, they would be in an ideal position to teach, model, and supervise safe practices. According to the social ecological theory, behavior change is a result of multiple levels of social influence. The involvement of parents and employers in supervision indicates a broad social network, from interpersonal to community, is in place to ensure students are safe when engaging in SAE activities.

Depending on the number of students with SAE projects, agricultural education teachers could potentially face high levels of stress regarding liability over maintaining adequate supervision. Therefore, we recommend agricultural education teachers continually engage community members for support in planning and supervising SAE work to ensure student safety. Potential collaborations could include Progressive Agriculture Safety Day Events, Farm Safety Just for Kids, as well as eXtension webinars hosted by the Agricultural Safety and Health community of practice. These programs would provide supervision and safety training for parents and community members to assist the secondary agriculture teacher in guiding students to follow proper safety procedures when engaged in SAE activities. As the social ecological theory suggests, safety behavior of youth is influenced by factors at multiple social levels. In addition, increasing community members' involvement with supervision and planning should provide additional opportunities for potential SAE placement sites thereby affording the secondary agriculture teacher the resources to engage each student with an SAE project.

Professional Development Needs of Secondary Agriculture Teachers

Through analysis conducted in this study, agriculture teachers are in need of professional development related to community supervisor involvement of SAE planning and supervision. The professional development need item with the highest level of agreement among responding teachers was "increasing community agribusinesses' participation in planning SAE programs." The professional development need item with the lowest level of agreement was "preparing safety guidelines for SAE programs." Almost the entire group of teachers (90.0%, $f = 208$) who responded agreed or strongly agreed there is a need for professional development to increase community agribusinesses' involvement in planning SAE projects. Developing partnerships with local agribusinesses and student employers is critical for school-based agriculture teachers, especially when they want to create greater involvement in student growth and program support.

While professional development needs related to supervisor involvement were greater than those related to safety, agriculture teachers still indicated a high need for professional development in areas of teaching and planning for SAE safety. Over three-fourths of responding teachers agreed or strongly agreed that agricultural education teachers need professional development related to teaching students how to perform technical skills safely, such as tractor operation (80.1%, $f = 185$), safe work habits for handling livestock, (79.9%, $f = 183$), and safe work habits for handling pesticides (78.3%, $f = 180$).

Intuitively it would seem these trainings fit teachers' decision criteria of preference within Runyan's (1998) proposed third dimension of Haddon's Matrix. Viewed through the Haddon matrix, these trainings would provide opportunities for injury prevention within the pre-event phase by addressing the human training factor when working with machinery and livestock (Haddon, 1980, 1999; Runyan, 1998). This intervention strategy would be vital in attempting to prevent the vehicle or vector from reaching the student in order to reduce exposure to hazards. Additional

investigation will be needed for these trainings regarding other decision criteria especially feasibility, cost, and effectiveness.

Increasing Safety for Youth Working in Agriculture through SAE

For SAE to remain a critical component of agricultural education, more must be done to reduce risks to youth working in agriculture, an industry which continues to have a high rate of fatal youth injuries (Estes, et al., 2010). The need for professional development is vital as the National Children's Center for Rural Agricultural Health and Safety (2012) continues to identify numbers of youth injured in tractor, machinery, livestock and horse incidents.

While this research only addressed production based SAE, it is a start to recognizing the importance of safety in agriculture. Further research and development strategies to identify risks and safety concerns in other SAE areas are recommended. Curriculum to support teacher professional development specifically related to SAE safety should be developed and delivered to improve the safety conditions for student workers. These professional trainings could serve to prepare teachers to model safety behaviors for influencing students' injury risk beliefs while engaging in concrete experiences of SAE programming. Additional research should investigate teacher awareness or estimation of students' cognitive and physical abilities to perform SAE work tasks.

The Wage and Hour Division of the Department of Labor (2007) views "direct and close supervision" as one experienced adult is working with the first student-learner on-site, and three experienced adults working alongside each additional student-learner thereafter. However, agricultural education has no such definition of "direct and close supervision." We recommend agricultural education professionals define this term to ensure proper supervision and safety of students engaged in SAE activities. Increased supervision involvement of parents/guardians and employers would be essential in achieving this recommendation.

It is necessary for the agricultural education profession to look at the risks and safety facing students involved in agriculture, particularly as it relates to SAE. It is the responsibility of the stakeholders in agricultural education to support the basic security need for students that they are seeking through the involvement in agricultural education and SAE. Finally, it is vital for leaders in agricultural education to take a proactive approach to protecting our youth in agriculture so that the next time youth labor laws and regulations are in jeopardy we can be the leaders.

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E-mail: rebecca.lawver@usu.edu