

Safety And Health Education Analysis of Texas' First Year Agriculture Teachers

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Abstract

Agricultural education programs have responsibilities to prepare students for both further study within the field or provide opportunities to develop skills needed to support entry-level employment in one of the many sectors within the food and fiber systems industry. As with many physical labor positions employees must utilize safe workplace practices. These practices are often learned through pre-employment training, such as an agricultural education program. Studies have indicated agriculture teachers do not receive adequate training, feel comfortable with teaching safety, or maintain current teaching resources to sufficiently instruct their students in proper practices. The purpose of this study was to determine the general preparedness of Texas agriculture teachers regarding safety and health education in agriculture and their perceptions of teaching resources available for use in their classrooms.

Using a census of entry year Texas agriculture teachers (N=118), teachers' preservice safety and health preparation and training were reviewed in addition to soliciting perspectives on available safety and health curricula, usage and practices. Responding teachers (n=74; 57 males, 17 females) were well distributed throughout the state both by FFA region and school enrollment size. A majority of respondents indicated they taught safety within units of instruction rather than as separate, individual units. Teachers indicated a variety of teaching technologies available for classroom usage, however the most useful safety materials they utilized were videotapes with an accompanying study guide. There was also a preference for simulations and demonstrations and individual student booklets. Few indicated a strong usefulness for slides, transparencies or interactive media.

General safety and health training received during preservice education was lacking with these entry year teachers although greater than 50 percent of the teachers had been trained in cardiopulmonary resuscitation (CPR) and first aid (20 percent currently certified). Industry also imparted many teachers with additional safety and health training experience.

From a teaching resource perspective, an unexpectedly large percentage of teachers had computers with CD-ROMs and Internet access, as well as the traditional equipment in slide projectors, televisions and VCRs available. Even though teachers had access to modern computer technology, there was a common aversion for using interactive media or Internet as teaching tools.

It was recommended that agriculture teacher education programs address the under representation of training regarding safety and health education and improve corresponding teaching materials. Additionally, increased efforts should be made to provide preservice teachers with an appreciation for safe work procedures in order for students to understand and follow safe work practices.

Introduction

Within our nation's public schools, concerns for the health and safety of student populations have recently grown in importance. Unfortunately, this attention has grown out of increasing instances of premeditated violent acts. One outcome of these tragedies has been revision of school and campus safety policies by administrators and has created a sense of urgency to improve general student safety. Commonly overlooked in these policies, however, are non-violent, unintentional injuries and personnel safety training. This is notably consequential, as the cause of greatest concern for the health of children and adolescents has become unintentional injuries (U.S. Department of Health and Human Services [DHHS] 1990).

In 1995, the National Safety Council reported there were 24 deaths per 100,000 agricultural workers and 140,000 disabling farm-related injuries (National Safety Council, 1996). This situation presents a special challenge for vocational education programs that are linked with dangerous occupations such as agricultural education is to agriculture. Considering teachers and administrators stand to a limited degree *in loco parentis* to students under their supervision, it is a necessity for agriculture teachers to model safe practices and behaviors, and to create a positive safety climate. This is important for reducing preventable injuries, not only while the student is in school but also when they enter the workforce.

School administrators must be encouraging while diligently developing a positive school safety climate. Ullrich (1996) recommended that to progress a sense of urgency for safety education, administrators should develop a written safety plan and a detailed documentation system. Additionally, Lauver and Frazee (1995) recommended Texas agriscience teachers receive more preservice and inservice education in the areas promoting positive safety attitudes. These two efforts may yield dividends by decreasing preventable injuries in agricultural education programs.

Safety and health education for agricultural education teachers has recently received increased consideration (Thompson, 1993; Ford and Walson, 1997). Swan (1993) recommended designating local and federal funds for use in improving safety and emergency equipment and instruction available to instructors and students. The importance of safety topics in preservice and inservice educational programs (Swan, 1993; Hubert, 1996) along with basic first aid and cardiopulmonary resuscitation (CPR) training / certification for agriculture teachers (Bear and Hoerner, 1978; Laird and Kahler, 1995 and Ullrich 1996) has been suggested and offered periodically. However, in most cases it is left to individual school districts to require faculty to obtain and/or keep certifications current.

Healthy People 2000 recommended education aim at both reducing injury risk and in preparing students to be knowledgeable members of the adult community. This recommendation corresponds with goals of youth leadership organizations such as FFA. If agricultural education students are promoted as future leaders, then training and modeling of proper agricultural safety measures is desirable. This is important, especially for Texas with secondary agricultural education enrollments of almost 90,000 including 58,000 FFA members (Texas Education Agency, 1999). Teachers within these programs must model the safety skills and be the archetype of a positive safety climate endorsement.

Agriculture has one of the higher rates of fatal injuries as compared to other occupations according to the U.S. Department of Labor (1998). Since a premise of agricultural education programs is to prepare students for careers in agriculture the issue of reducing injuries, illnesses,

and fatalities is essential to their training. The development of a positive and continuous safety climate within an agricultural education program is directly influenced by the personal attitudes and beliefs of the teachers managing that program. As such, a need has been established to determine the scope of health and safety education preparation for agriculture teachers including teaching resources used in secondary agricultural education programs.

Purpose / Objectives

The purpose of this descriptive study was to provide benchmark data for the assessment of the knowledge, attitudes, and perceptions regarding agricultural safety issues and curricula held by Texas agriculture teachers with less than two full years of teaching experience. The study was supported by CDC/NIOSH funds from Cooperative Agreement # U07/CCU612017. Four objectives were developed to guide this study.

1. Identify selected demographic characteristics of Texas agricultural science teachers with less than two full years of teaching experience.
2. Determine curricula and types of teaching materials used to address agricultural safety and health by Texas agricultural science teachers with less than two full years of teaching experience.
3. Ascertain most preferred and usable types of curricula as perceived by Texas agricultural science teachers with less than two full years of teaching experience.
4. Describe the emergency care preparedness of Texas agricultural science teachers with less than two full years of teaching experience.

Methods / Procedure

The target population was Texas agriculture teachers with less than two full years of teaching experience and were selected from a database of over 1400 Texas Agricultural Science teachers. The Vocational Agricultural Teachers Association of Texas (VATAT) database of first year teachers served as the frame with 98 teachers identified. Duplicates and foreign elements were removed. Missing elements were identified from university entry-year teacher lists and added which adjusted the frame to 118 identified teachers.

Descriptive research methodology was used to collect data. The instrument design was a booklet style questionnaire. The instrument contained six sections: (I) demographics, (II) agricultural curricula and teaching materials, (III) classes taught 1998-99, (IV) personal health and safety training, (V) personal beliefs and (VI) personal practices. This manuscript will only investigate the responses for Sections I-II and IV-VI. Teacher educators, and state agricultural education staff from Texas and Oklahoma served as a panel of experts to review the instrument for face and content validity. Appropriate revisions were completed based on comments. To insure reliability, the instrument was administered to several agricultural science teachers in southeast Texas. Following review and revision the instrument was distributed.

Data were collected over an eight-week period during the spring of 1999. The instrument, cover letter, self-addressed, postage-paid envelopes and detailed instructions were mailed during first week of April 1999. After approximately two weeks, reminder postcards were sent to those failing to respond. Two weeks later a second survey was mailed. Non-

respondents from both mailings were phoned. A final attempt to secure data on the target population was conducted via recruitment and curricula distribution booths at the 1999 Texas FFA convention and VATAT Professional Improvement Conference.

Completed instruments were collected from 74 of the identified 118 agriculture teachers (63% response rate). Descriptive statistics, ANOVA, T-tests, and regression procedures were conducted and all results analyzed at the .05 level of significance.

Findings

Of the 74 teachers meeting the entry year qualification, there were 57 males (77.03 %) and 17 females (22.97 %). This was a larger percentage of females than the current female percentage of 8.98 percent for Texas agricultural education teachers (TEA, 1999). The mean age was 27.31 years. For data analyses teachers were placed in two groups by age: a traditional age group “20-25 years old” (n=40) and a non-traditional age group of “26 years or greater” (n=32). Males were evenly distributed between the two groups (29 and 28 respectively) while almost twice the numbers of females were in the younger grouping (11 and 6 respectively).

Teachers were well distributed throughout the VATAT areas that follow the area structure established by the Texas FFA Association. The ten Texas Areas are illustrated in Figure 1.

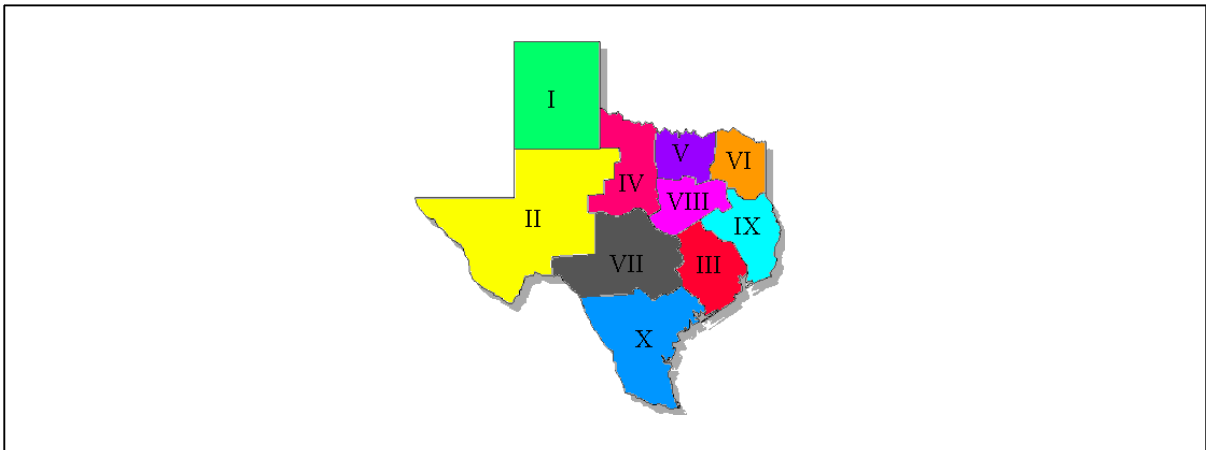


Figure 1. Vocational Agriculture Teachers Association of Texas (VATAT) Areas.

The highest frequency of respondents was in Areas III (14, 18.92%), IX (10, 13.51%), and X (8, 10.81%). The remaining seven Areas had between four (5.41%) and seven (9.46%) respondents per area (Table I).

Table I. Texas Entry-Year Teacher Distribution by FFA Area (1998-99).

	Area										
	I	II	III	IV	V	VI	VII	VIII	IX	X	N
Number of teachers	4	7	14	7	5	6	6	7	1	8	74

To determine distribution by school size, respondents were asked to identify the enrollment size of their school by University Interscholastic League (UIL) conference. The division levels for Texas high school competitions are based on enrollments and are divided as follows: 5A (1,780 students or greater), 4A (780-1,779 students), 3A (345-779 students), 2A (160-344 students), and 1A (159 students or fewer) (University Interscholastic League, 1999). Data indicated a mean of 146.16 students enrolled in these agricultural education programs (range 16-625) of which 91.18 were FFA members (range 5 to 350). The distribution of teachers by UIL conference / school enrollment are presented in Table II.

Table II. Entry-year Teacher Distribution By UIL Conference / School Enrollment (1998-99).

	Conference Classification					N
	1A	2A	3A	4A	5A	
Number of teachers	15	15	19	13	10	72

Teachers were asked to identify if they addressed agricultural safety and health topics as separate, individual units of instruction or as subjects within instructional units. Thirty-two teachers (43.24%) indicated that they taught safety as a separate unit with the remaining 42 teachers (56.76%) addressing safety and health as specific subjects within larger units such as “cattle handling safety” while covering cattle production.

Teachers indicated from a provided list which technologies they had available at their respective schools. The most common technology identified by all teachers was televisions with videotape players and overhead projectors. Sixty-six (90.41%) had slide projectors, while 63 (85.14%) confirmed that a computer with Internet accessibility was available. Over 60 percent (62.16) checked CD-ROM availability. The least available equipment were laserdisc players (17.57%) and one teacher declared having a laptop computer for presentations. No statistical significant differences were found based on any demographic.

As shown in Table III, teachers ranked the types of *new* teaching resources according to greatest value and use (1=most useful— 6=least useful). It was determined that the most useful formats for new materials were videotapes and study guides (mean 1.90, sd 1.00). Secondary preference was indicated for demonstrations/simulations (2.51, 1.36). Within the two age groupings, the preferred resource type was videotape and study guide, but there was a significant difference in the perceived usefulness of transparencies. The non-traditional group ranked transparencies as more useful (mean 3.59, sd 1.39), a significantly different value from the age 20-25 group (4.25, 1.10).

Table III. Entry-year Teacher Age Group Comparison of Usefulness of Teaching Resources

	<u>Age 20-25</u>		<u>Age 26+</u>		<u>Aggregate</u>		F	P
	Mean	SD	Mean	SD	Mean	SD		
Videotape and study guide	1.83	0.93	2.00	1.08	1.90	1.00	0.55	0.4623
Class demonstration/ Simulation activities	2.32	1.38	2.75	1.32	2.51	1.36	1.75	0.1907
Individual student booklets	3.75	1.48	3.38	1.58	3.58	1.53	1.07	0.3037
Transparencies	4.25	1.10	3.59	1.39	3.96	1.27	5.00	0.0286*
Interactive media	4.33	1.87	3.84	2.00	4.11	1.93	1.10	0.2969
Slides	4.20	1.49	4.19	1.62	4.19	1.53	0.00	0.9729

* significant at $\alpha = .05$

Emergency care preparedness of new teachers was also a health topic of this study and is presented in Table IV. Over half of the respondents (37/72, 51.39%) had received cardiopulmonary resuscitation (CPR) training. Twenty of those teachers (54.05%) were in the age 20-25 grouping. However, only 16 of the 72 teachers (22.22%) kept certifications current.

Seventy-two teachers responded to inquiries of first aid training. Similar to CPR training, 38 (52.77%) teachers had received first aid training, with 20 (52.63%) responses coming from the younger group. Only eight (21.05%) of these 38 teachers had current certification in first-aid.

Lastly, information was sought as to identify completion of a general health and/or safety related course. Forty-three (58.90%) of the 73 teachers recorded that they had taken and completed a health class prior to teaching. Twenty-six (60.47%) of the 43 represented the age 20-25 group with the remaining 39.53 percent from the age 26 or greater group. The health and/or safety course was a requirement of graduation for just less than one third of all respondents.

Table IV. Emergency Care Preparedness and Safety Training of New Teachers in Texas

	<u>Age 20-25</u>			<u>Age 26 or greater</u>			<u>Aggregate</u>		
	Yes	No	Certified Currently	Yes	No	Certified Currently	Yes	No	Certified Currently
CPR trained (n=72)	20	19	8	17	16	8	37	35	16
FA trained (n=72)	20	19	5	18	15	3	38	34	8
Private industry - safety training (n=70)	11	27	NA	16	16	NA	27	43	NA
	<u>Yes</u>	<u>No</u>	<u>Required</u>	<u>Yes</u>	<u>No</u>	<u>Required</u>	<u>Yes</u>	<u>No</u>	<u>Required</u>
Health class	26	13	16	17	17	8	43	30	24

Conclusions

There were several areas of concern and interest documented by the findings of this study of Texas' entry year teachers. The demographic data indicated that increasing numbers of females have entered this traditionally male-dominated career field. Females made up almost one quarter of the new teachers during the 1998-99 academic year in the agricultural education classrooms across Texas. This was a substantially higher percentage as compared to the percentage of female agriculture teachers in Texas overall (nine percent). The average age of these new teachers was just over 27 years old and although considerably higher than expected, it may reflect the current practice of recruiting pre-service teachers from the ranks of college graduates in other disciplines or others returning to school following a few years of work experience in other fields. These non-traditional teacher prospects may bring a stronger sense of safety and student health responsibility to their teaching positions after serving in agricultural business operations.

An area of consequence revealed by data was the surprisingly low FFA membership percentage (62.38%) in programs with entry-year teachers. If extracurricular (FFA) activities are integral to student learning experiences, then a low membership percentage presents a unique problem for inexperienced teachers. Furthermore, the large portion of teachers that did not teach safety and health topics within larger units may substantiate a lack of continuous safety education integration in a program and a weakness in the establishment of an overall safe climate. This study also reveals an element of weakness in curricula utilized by the teacher, and in the teacher preparation programs failing to provide these individuals for the challenge of integrating safety and health concepts throughout the curriculum.

A large percentage of teachers had access to computers with both Internet access and CD-ROM's, as well as the more traditional audio/video equipment in slide projectors,

televisions and VCRs. It was interesting that even though these teachers largely had access to modern computer technology, they disliked using interactive media whether from CD-ROM's or Internet as teaching tools. In comparison, they also tended to rank traditional resources such as videotapes and class demonstration / simulation activities highly. This could be indicative of not receiving adequate training on the use of newer, interactive media as teaching tools during their pre-service training programs. This appears contradictory to research that indicates students enjoy and learn well when these resources are included in teaching methodologies. Another factor to be considered regarding the lower ranking of interactive media is that easy to use, inexpensive interactive media teaching resources may not be available or accessible to these teachers.

Glaring concerns exist related to maintaining emergency care preparedness certifications and health and safety education training. Improvements are needed in this area since only a relative small percentage of the teachers are currently certified in CPR and first-aid and less than one-third of these teachers having been exposed to a required a health or safety course.

Recommendations

It is imperative that all teachers, both new and veteran groups, involved with extracurricular activities receive CPR certification and it is highly recommended that CPR certification and first-aid training be incorporated into all agriculture teacher education programs. It is further recommended that CPR certification and first aid training workshops be offered at the annual Professional Development Conference for Texas' agriculture teachers in order to help meet the recent state mandate for such training.

This study found that even though a vast majority of schools with entry-year agriculture teachers have access to computer technology, teachers do not rate the use of interactive media very highly as a teaching tool. It is recommended that teacher education programs place additional emphasis on developing these skills in teacher education programs.

A compilation of easy-to-use, interactive agricultural safety education media materials need to be developed for use specifically for agriculture teachers. For best results, these multimedia materials should be available at low or no cost to agricultural education programs through the use of state or federal funds. Furthermore, safety education and injury prevention teaching materials and resources should to be developed to specifically meet the needs of agricultural education students and teachers.

Further research may be necessary to address unique concerns of females in agricultural education. Additional investigation into the female perspective of safety and health issues could reveal topics not previously considered as high priority. Another issue for review is the finding that these teachers' were older than those considered traditional. Similar research should be undertaken to address safety and health attitudes of all agriculture teachers and in the safety climate perceptions of agricultural education programs overall. This study should be replicated annually in Texas, as well as in other states, to provide the data necessary for the longitudinal analysis of safety education. Longitudinal analysis will enable us to accurately determine the benefits and outcomes of safety education programs.

References

- Bear, F. and Hoerner, T. (1978). Planning, Organizing, and Teaching Agricultural Mechanics. Hobar Publications. St. Paul, Minnesota.
- Department of Health and Human Services (DHHS), (1990). Healthy People 2000: National health promotion and disease prevention objectives. Public Health Service Publication No. 91-50212.
- Ford, C. and Walson, F. (1997, July). Laboratory safety practices among agricultural education teachers in North Carolina. Poster presented at the National Institute for Occupational Safety and Health, Agricultural Health and Safety Conference, Morgantown, West Virginia.
- Hubert, D. (1996). An assessment of agricultural mechanics course requirements in agriculture teacher education programs in the United States. Unpublished master's thesis, Oklahoma State University, Stillwater, OK.
- Laird, S. and Kahler, A. (1995). Present and future emphasis of secondary school agricultural mechanics programs in the United States. In Proceedings of the 22nd Annual National Agricultural Education Research Meeting. Denver, Colorado.
- Lawver, D. and Frazee, S. (1996). Factor analysis of variables related to student attitudes and perceptions concerning agricultural mechanics laboratory safety. In Proceedings of the 22nd Annual National Agricultural Education Research Meeting. Denver, Colorado.
- National Safety Council (1996). Accident facts, 1995 Edition. Itasca, IL: National Safety Council
- Swan, M. (1993). Safety practices in agricultural mechanics laboratories. Proceedings of the 20th National Agricultural Education Research Meeting. Nashville, TN.
- Texas Education Agency (1999). Texas FFA Past and Present: Facts, Mission, and Motto. <http://www.txaged.org/tfa-fact.html>. Retrieved from Internet, November 16, 1999.
- Thompson, R. and Garton, B. (1997, July). The needs of secondary agriculture teachers relative to teaching health and safety. Poster presented at the National Institute for Occupational Safety and Health, Agricultural Health and Safety Conference, Morgantown, West Virginia.
- Ullrich, D. (1997). Safety procedures, education and standards in selected Oklahoma agricultural education programs. Proceedings of the 47th Southern and 16th Western Regions Agricultural Education Research Meeting, April 4-5, 1997. Stillwater, OK.

University Interscholastic League (1999). Constitution and Bylaws. Subchapter I, Section 351: Conference based on enrollment. <http://www.utexas.edu/admin/uil/rules/subi.html>. Retrieved from the World Wide Web on December 6, 1999.

Safety And Health Education Analysis of Texas' First Year Agriculture Teachers

A Critique

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Safety issues have been, and continue to be, of the utmost importance in agricultural education programs. Teaching students about safety issues affords teachers to provide instruction in the affective domain, the domain of learning in which the least amount of instruction typically occurs in our programs. Yet we know that to change one's attitude toward safety issues can be a monumental task. Therefore, agricultural education teachers must accept the responsibility to be a role model for students in promoting safe practices in agricultural education.

This paper is part of a larger study conducted by the authors to assess the knowledge, attitudes, and perceptions of agricultural education teachers regarding agricultural safety issues and curricula. The previous paper presented by the authors in this session addressed the other aspects of this larger study. The authors again provide a solid background and theoretical framework for the study. I also commend the authors for having a clearly stated purpose and objectives for the study. Descriptive research methods were used to collect data for the study and appropriate analysis procedures were used.

I found the results of the study to be interesting. Many of the resources identified for teaching safety issues are traditional resources. I would be interested to know if teachers use other resources (like resource people or safety/rescue personnel with practical experiences) with their classes on safety issues? Would these not be excellent resources to use in the class and be of more practical significance in addressing safety issues? While health and safety information can be acquired from traditional sources, getting information from someone who has practical experience can be more meaningful to students.

I also raise the question concerning the information presented in Table 4. I would suspect that the health class completed by undergraduate students was just that – a health class. Safety issues important to the scope of our programs were probably not addressed. Is there an agricultural safety class undergraduate students could complete that addresses safety issues in all aspects of agriculture? Where else in the preservice curriculum can future teachers acquire information about safety issues.

I commend the authors for addressing an important topic. I would encourage them to consider research safety issues in other areas of agriculture to include issues other than the traditional safety practices we should practice. As our high school programs become more science based in nature, we need to focus on developing safe habits in these environments and must make sure our students develop these safe practices as well.