

Professional Development Needs of Tennessee School-Based Agricultural Education Teachers

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Abstract

School-based agricultural education (SBAE) teachers feel the skills and knowledge they bring into the classroom may be inadequate for providing their students with the tools needed to face the changing world. The purpose of this study was to explore the professional development needs of Tennessee school-based agricultural education teachers. In addition, this study sought to determine if differences existed in the professional development needs of Tennessee school-based agricultural education teachers based on selected demographic variables. The sample for this descriptive study was 127 SBAE teachers in Tennessee. The researchers modified an existing survey instrument and used descriptive statistics to describe the demographic data and professional development delivery preferences. To describe the professional development data, mean weighted discrepancy scores were used. The top five rated professional development items were (a) utilizing the Common Core in agricultural instruction, (b) teaching critical thinking skills, (c) managing stress, (d) balancing work and personal life, and (e) teaching problem solving skills. We recommend professional development be developed and offered related to the Common Core Standards, critical thinking, and problem solving. In regard to managing stress and balancing work and personal life, numerous factors such as extended contracts, implementing the total program (FFA, SAE, and instruction), new educational initiatives, and deficiencies in content or pedagogical knowledge may be contributing to these needs. Future research should investigate this matter in Tennessee and determine the most appropriate means for reducing work and personal life conflicts and stress. These recommendations should positively impact student success, since understanding teachers' needs are linked to student achievement.

Introduction/Literature Review

Student achievement has been the focus and unit of measure for school system success for years (Shoulders & Myers, 2014). In the late 1980s and throughout the 1990s, major educational reforms arose in the United States (Phipps, Osborne, Dyer, & Ball, 2008). Rigorous schedules of

standardized testing were on the rise during this time in order to stimulate student performance, chart achievement gains at the district and state levels, and promote core academic learning (Phipps, et al., 2008). Urbanization, global agricultural production capacity, biotechnology and digital equipment began to change the landscape of agriculture (National Research Council, 1988). Vocational agriculture education programs began to adapt and change their programs because curricula had to complement major goals for learning in the core subjects of math, science, reading, and writing as well as the new challenges in agriculture (Phipps, et al., 2008; National Research Council, 1988). In 1988, the National Research Council established the Committee on Agriculture Education in Secondary Education and released *Understanding Agriculture: New Directions for Education*. The report stated agriculture education must be more than vocational agriculture and revisions needed to be made to agriculture education at large. In response, schools began to integrate concepts from core subjects into the agriculture classroom (Phipps, et al., 2008). Agricultural literacy was also deemed necessary in order to educate all students about the food and fiber system (National Research Council, 1988). Thus, agriscience programs began in schools across the nation (Phipps, et al., 2008).

The educational reform initiatives of the 1990s emphasized testing, school and program evaluation and accountability, and increased standards for student achievement (Phipps, et al., 2008). Due to these initiatives, school-based agricultural education (SBAE) teachers have faced many challenges in their programs. Restrictions on number of field trips, FFA events, and so forth have been limited due to school administrators wanting to keep absences from core subjects to a minimum, but still demanding students be career ready (Phipps, et al., 2008). Additionally, agriculture continues to evolve and now includes forestry, nutrition, environmental sciences and life sciences (National Research Council, 2009). There is also a greater focus on the integration of global agricultural markets, how agriculture impacts the environment, consumer influence, growing demand for local and organic foods, rising concerns with obesity, and how the demographics of the agricultural workforce has changed (National Research Council, 2009). With these changes, many SBAE teachers feel the skills and knowledge they bring into the classroom may be inadequate for providing students with the tools needed to face the changing world (Sorensen, Tarpley, & Warnick, 2010). These feelings may indicate the need for professional development in order to help SBAE teachers face new educational and agricultural challenges.

To that end, Estep, Thoron, Roberts, and Dyer (2014) posited that in order to maintain professional competence, all teachers must continuously learn throughout their careers. Similarly, Sorenson, Tarpley, and Warnick (2010) indicated SBAE teachers require some form of regular professional development to help cope with the rising demands of their profession. Professional development opportunities are designed and implemented to increase teacher learning, which can result in furthering student achievement (Shoulders & Myers, 2014). According to Supovitz and Turner (2000), professional development is considered the most effective outlet for implementing changes in teacher behavior and practices. Similarly, Shoulders and Meyers (2014) purported professional development to be the ultimate keystone for initiating teacher change, and teachers' personal perceptions and behaviors can be improved through professional development. Furthermore, Shoulders and Meyers concluded when professional development activities included the following core features: (a) focus on content, (b) coherence, (c) sufficient duration and (d) collective participation, teachers benefited more

from these activities than solely from active learning. Additionally, they recommended these core features be taken into consideration when designing and implementing future professional development.

Research specifically on professional development needs for SBAE teachers suggest needs vary based on years of experience and by state (Duncan, Ricketts, Peake, & Uessler, 2006; Garton & Chung, 1996; Joergen 2002; Veeman, 1984). New agriculture teachers often experience greater difficulty with classroom management, motivating students, finding quality teaching materials, managing student behavior and discipline, and understanding and implementing school and community policies (Joerger, 2002; Veeman, 1984). Garton and Chung (1996) found there is a great need for helping new agricultural educators in numerous areas such as motivating their students, conducting local FFA chapter activities, and teaching using experiments. Furthermore, new agriculture teachers have a greater need for learning how to complete reports for their school administration, preparing quality FFA degree and proficiency applications, incorporating agriscience into their curricula, effectively utilizing alumni, advisory committees and youth organizations, developing SAE opportunities for their students, and effectively using public relations (Garton & Chung, 1996; Joerger, 2002; Layfield & Dobbins, 2002). Additionally, Garton and Chung found new agricultural educators need less information surrounding content knowledge and skills in agricultural construction, relation of agriculture to the environment, general knowledge about plants, and parent teacher conferences.

In regard to professional development needs by state, Layfield and Dobbins (2002) found SBAE teachers in South Carolina needed professional development in using computers, completing FFA degrees and proficiency applications, effectively using multimedia in the classroom, and better record keeping skills. Furthermore, South Carolina's experienced teachers vocalized a need in better overall integration of technology in the classroom and organizing and developing activities for youth and adult education (Layfield & Dobbins, 2002). In 2006, Georgia agricultural education teachers indicted professional development was needed to effectively integrate current advances in agricultural technology into the classroom and curriculum, develop SAE opportunities for students, and prepare better proficiency and degree application (Duncan, Ricketts, Peake, & Uessler, 2006). Furthermore, while significant research lacks in the areas of professional development needs based on gender and grade level, Estep et al. found female agricultural teachers in Florida had a need for professional development related to integrating math and science into the curricula as well as balancing work and personal life.

Purpose and Objectives

The purpose of this study was to explore the professional development needs of Tennessee SBAE teachers. No prior research was found on professional development needs of this population. In addition, this study sought to determine if differences existed in the professional development needs of Tennessee SBAE teachers based on selected demographic variables. Specifically, three research questions guided this study.

1. What are the professional development needs of Tennessee SBAE?
2. What differences exist, if any, in the professional development needs of SBAE teachers based on years of teaching experience, undergraduate major, gender, length of employment contract, and geographic region?

3. What are the professional development delivery preferences of Tennessee SBAE teachers?

Methods/Procedures

This descriptive study was conceptualized as a slice in time (Oliver & Hinkle, 1982) and was approved by the University of Tennessee's Institutional Review Board. The target population was SBAE teachers ($N = 330$) in Tennessee. Contact information for the teachers was provided by the Tennessee FFA Foundation. Data were collected during the spring 2013 semester using the Qualtrics online survey platform. Dillman, Smyth, and Christian's (2009) web survey implementation procedures guided the multiple contacts made. Dillman et al. stated little research exists on the optimal combination of contacts and suggested additional contacts are not needed when responses per contact stalls. Thus, six emails were sent to the entire target population by the researchers: (a) prenotice, (b) email with a link to the survey, (c) three reminder emails with a link to the survey, and a (d) final email with a link to the survey announcing the end of the study. One hundred eight teachers completed the survey and 12 declined to participate. In addition to these contacts, Tennessee's agriculture, food and natural resources consultant and two teacher educators sent email contacts encouraging the agricultural education teachers to complete the survey. Following this data collection period, the researchers also presented the opportunity to participate in this study to the SBAE teachers during the FFA summer camp and the summer professional development conference, which yielded 19 additional responses. Therefore, data were collected from 127 SBAE teachers or 38.5% of the target population.

To address potential nonresponse bias, the researchers compared early to late respondents on all items and compared respondents to the target population for the only known variables of gender and geographical region. These analyses were done to examine the external validity of the responses to the target population (Ary, Jacobs, Sorensen, & Walker, 2014). To that end, Lindner, Murphy, and Briers (2001) suggest defining early and late respondents based on the contacts made, and stated the minimum number of responses that should be categorized as late is 30 to ensure statistical meaning. Based on Lindner et al., the researchers classified the last 34 responses or the last three contacts as late respondents. Chi-square tests were utilized for nominal data and MANOVA was used for interval data. No differences were found between early and late respondents. The sample was also representative of the target population in regard to gender but was not representative in regard to geographical region. As a result, data were weighted according to Biemer and Christ (2008) to create a sample that was representative of the target population in regard to geographical region. After data were weighted based on geographical region, data were compared to the target population again and was found to be representative based on gender and geographical region.

The survey used in this study was a modified version of Estep, Thoron, Roberts, and Dyer's (2014) professional development survey. The researchers reviewed Estep et al.'s survey and removed items not pertinent to Tennessee, reworded items to reflect Tennessee's program of study, and added items specific to SBAE in Tennessee. Face and content validity were verified by an expert panel consisting of three agricultural education faculty, three SBAE teachers, and Tennessee's agriculture, food and natural resources consultant. Based on the recommendations

of the expert panel, two items were added and three items were revised for clarity. The final survey consisted of 85 items. Seventy-five items asked the teachers to provide their perceived levels of knowledge and relevance on competencies related to SBAE in Tennessee. Knowledge and relevance items were measured using a 5-point rating scale (1 = *low knowledge or relevance* and 5 = *high knowledge or relevance*). Post-hoc reliability was assessed for the aforementioned items using Cronhach's alpha ($\alpha = .97$). The remaining 10 items consisted of nine demographic questions and one professional development delivery question.

Data were analyzed using IBM SPSS 20. Descriptive statistics (i.e., frequencies, percentages, and means) were used to describe the demographic data and professional development delivery preferences. To describe the professional development data, mean weighted discrepancy scores (MWDS; Borich, 1980) were used. Furthermore, the years of teaching experience data were grouped based on Steffy and Wolfe's (2001) life-cycle model for career teachers.

Results/Findings

The top five rated professional development items were (a) *utilizing the Common Core in agricultural instruction* (MWDS = 4.20), (b) *teaching critical thinking skills* (MWDS = 3.92), (c) *managing stress* (MWDS = 3.76), (d) *balancing work and personal life* (MWDS = 3.64), and (e) *teaching problem solving skills* (MWDS = 3.56). The professional development items MWDS ranged from -1.11 to 4.20. A complete list of professional development items and MWDS are found in Table 1.

Table 1
Mean Weighted Discrepancy Scores for Professional Development Items

Item	Knowledge		Relevance		MWDS
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Utilizing the Common Core in agricultural instruction	2.82	1.20	3.87	1.12	4.20
Teaching critical thinking skills	3.70	0.89	4.53	0.65	3.92
Managing stress	3.49	1.01	4.37	0.86	3.76
Balancing work and personal life	3.29	1.10	4.38	0.82	3.64
Teaching problem solving skills	3.77	0.92	4.52	0.68	3.56
Managing time	3.67	0.91	4.43	0.77	3.25
Motivating students	3.84	0.90	4.60	0.63	3.23
Recruiting students	3.73	0.94	4.38	0.92	2.79
Teaching decision making skills	3.85	0.83	4.50	0.70	2.77
Integrating reading strategies into agricultural instruction	3.64	0.98	4.28	0.79	2.72
Managing the classroom	4.04	0.83	4.60	0.58	2.71
Modifying instruction for Special Needs Students	3.68	0.92	4.27	0.75	2.53
Managing facilities	3.76	0.83	4.35	0.80	2.52
Completing award applications (i.e. proficiencies, star awards, chapter awards)	3.24	1.01	3.87	1.07	2.45
Integrating science into agricultural instruction	3.95	0.99	4.50	0.66	2.39
Integrating math into agricultural instruction	3.82	0.85	4.34	0.74	2.07

Integrating content from academic End of Course Exams or TCAP concepts into agricultural instruction	3.11	0.94	3.66	1.13	2.02
Fundraising	3.65	0.91	4.18	0.94	2.02
Offering/implementing the Tennessee SAE course	2.52	1.13	3.17	1.31	2.00
Designing curricula	3.58	0.95	4.07	0.95	1.96
Preparing for Career Development Events	3.66	0.91	4.15	0.97	1.95
Teacher evaluation system (i.e. TEAM, TAP, etc.)	3.26	0.95	3.75	1.22	1.95
Teaching in laboratory settings (ex. Land lab, greenhouse, garden, ag mechanics lab, etc.)	4.01	0.97	4.49	0.80	1.90
Repairing and reconditioning agricultural tools and equipment	3.13	1.21	3.65	1.30	1.90
Teaching using technology	3.88	0.85	4.37	0.79	1.89
Developing public relations	3.59	0.96	4.06	1.03	1.89
Teaching leadership	3.94	0.83	4.45	0.75	1.86
Supervising non-traditional SAEs	3.33	1.11	3.75	1.19	1.77
Preparing reports for administrators	3.66	0.89	4.10	1.00	1.76
Developing SAE opportunities for students	3.63	0.99	4.10	1.01	1.72
Evaluating student performance	3.85	0.79	4.26	0.73	1.66
Understanding learning styles	3.72	0.80	4.16	0.78	1.65
Developing lesson plans	3.85	0.89	4.23	.087	1.56
Completing a Program of Activities	3.55	1.13	3.98	0.99	1.55
Utilizing a local advisory committee	3.72	1.01	4.08	0.97	1.47
Determining content to be taught in specific courses	3.69	0.91	4.05	0.94	1.45
Recruiting alumni	3.08	1.04	3.51	1.27	1.44
Recruiting volunteers	3.33	1.00	3.71	1.12	1.41
Designing programs for non-traditional students	3.20	1.00	3.57	1.10	1.40
Teaching Record-Keeping Skills	3.36	0.98	3.72	1.13	1.30
Developing relationships with other local agricultural organizations and agencies	3.90	0.88	4.22	0.86	1.27
Collaborating with teachers in other subjects	3.66	0.93	4.00	0.97	1.24
Locating and selecting reference materials	3.74	0.85	4.05	0.79	1.23
Evaluating the local agricultural education program	3.72	0.88	4.00	1.02	1.12
Collaborating with other agriculture teachers	3.96	0.89	4.22	0.85	1.07
Counseling students interested in post-secondary education	3.92	0.68	4.18	0.88	1.04
Selecting course offerings to fit the needs of the community	3.75	0.92	4.00	1.15	0.99
Teaching Agriscience	3.59	1.13	3.76	1.36	0.69
Teaching Veterinary Science	2.81	1.11	3.03	1.46	0.68
Teaching Agricultural Mechanics and Maintenance	3.07	1.40	3.29	1.58	0.68
Teaching Agricultural Power and Equipment	2.91	1.39	3.13	1.59	0.64
Teaching Plant Biotechnology	2.46	1.21	2.68	1.47	0.57
Teaching Agricultural Engineering	2.77	1.36	2.95	1.58	0.53
Supervising traditional SAEs	3.75	1.00	3.86	1.09	0.41

Teaching Aquaculture/Hydroponics	2.50	1.22	2.64	1.48	0.38
Teaching Financial Management	3.06	1.05	3.19	1.24	0.37
Teaching Floral Design	2.37	1.31	2.44	1.51	0.19
Managing volunteers	3.44	0.91	3.48	1.12	0.17
Teaching Greenhouse Management	3.65	1.11	3.66	1.53	0.08
Teaching Small Animal Care	3.09	1.21	3.11	1.53	0.07
Teaching Forestry Management	2.88	1.15	2.89	1.50	0.03
Teaching Equine Science	2.81	1.19	2.76	1.51	-0.11
Teaching Animal Biotechnology	2.53	1.06	2.45	1.28	-0.15
Teaching Leadership Communications	3.42	1.13	3.38	1.41	-0.17
Teaching Wildlife Management and Recreation	3.17	1.12	3.03	1.45	-0.34
Teaching Agricultural Sales and Marketing	2.65	1.07	2.48	1.32	-0.40
Teaching Landscaping and Turf Management	3.47	1.18	3.32	1.51	-0.54
Teaching Agricultural Economics	2.60	1.11	2.35	1.28	-0.59
Teaching Advance Principles of Agricultural Sciences	3.23	1.21	3.01	1.50	-0.64
Teaching Agricultural Business/Finance	2.70	1.14	2.38	1.34	-0.74
Teaching Plant and Soil Science	3.48	1.15	3.24	1.49	-0.75
Teaching Principles of Agricultural Sciences	3.73	1.13	3.49	1.55	-0.85
Teaching Principles of Horticultural Sciences	3.37	1.18	3.06	1.54	-0.94
Teaching Exploring Agricultural Science	3.29	1.24	2.90	1.51	-1.07
Teaching Livestock Management	3.37	1.16	3.00	1.45	-1.11

Note. Items are ranked highest to lowest priority.

Similarities and differences were present in professional development needs among SBAE teachers in Tennessee based on years of teaching experience, and no one items was found in every group. *Utilizing the Common Core in agricultural instruction* was rated top five for all groups except 0-5 years of experience, and *balancing work and personal life* and *teaching critical thinking skills* were rated top five for all groups except greater than 20 years of experience. Additionally, *managing stress* was rated top five for all groups except 11-20 years of experience, and *motivating students* was top five for the 11-20 and greater than 20 years of experience groups. A complete list of top five professional development items based on years of teaching experience is found in Table 2.

Table 2
Top Five Mean Weighted Discrepancy Scores Based on Years of Teaching Experience

Years of Teaching Experience	Item	MWDS
0-5	Teaching problem solving skills	6.12
	Teaching critical thinking skills	5.80
	Managing stress	5.43
	Balancing work and personal life	5.21
	Managing the classroom	4.98

6-10	Managing stress	5.75
	Utilizing the Common Core in agricultural instruction	5.70
	Teaching critical thinking skills	4.77
	Teaching problem solving skills	4.59
	Balancing work and personal life	4.48
11-20	Utilizing the Common Core in agricultural instruction	4.69
	Teaching critical thinking skills	4.00
	Balancing work and personal life	3.72
	Motivating students	3.43
	Managing time	3.31
>20	Managing stress	2.14
	Motivating students	1.91
	Utilizing the Common Core in agricultural instruction	1.83
	Fundraising	1.71
	Managing facilities	1.54

Similarities were mostly present in professional development needs of SBAE based on their undergraduate major. The one item not present in teachers who majored in agriculture education was *teaching problem solving skills*. Whereas those who majored in a specific agricultural content area did not have *motivating students* as a professional development factor. Both groups possessed (a) *utilizing the Common Core in agricultural instruction*, (b) *teaching critical thinking skills*, (c) *balancing work and personal life*, and *managing stress* in their top five. A complete list of the top professional development needs of SBAE teachers based on their undergraduate degree is found in Table 3.

Table 3
Top Five Mean Weighted Discrepancy Scores Based on Undergraduate Degree

Major	Item	MWDS
Agricultural Education	Utilizing the Common Core in agricultural instruction	4.02
	Teaching critical thinking skills	3.73
	Balancing work and personal life	3.61
	Managing stress	3.48
	Motivating students	3.44
Specific Agricultural Content Area	Teaching critical thinking skills	4.23
	Managing stress	4.09
Content Area	Utilizing the Common Core in agricultural instruction	4.04
	Teaching problem solving skills	3.96
	Balancing work and personal life	3.38

Similarities and differences were present in professional development needs of male and female SBAE teachers. Three items were rated top five in both groups (a) *utilizing the Common Core in agricultural instruction*, (b) *teaching critical thinking skills*, and (c) *balancing work and personal life*. Males identified (a) *managing stress* and (b) *managing time* as two top rated professional development needs that were different than females. Whereas females identified (a) *teaching problem solving skills* and (b) *modifying instruction for special needs students* as

professional development needs different than males. A complete list of professional development needs of male and female SBAE teachers is found in Table 4.

Table 4
Top Five Mean Weighted Discrepancy Scores Based on Gender

Gender	Item	MWDS
Male	Utilizing the Common Core in agricultural instruction	3.81
	Managing stress	3.65
	Teaching critical thinking skills	3.34
	Balancing work and personal life	3.24
	Managing time	3.20
Female	Teaching critical thinking skills	5.27
	Utilizing the Common Core in agricultural instruction	5.25
	Teaching problem solving skills	4.96
	Balancing work and personal life	4.64
	Modifying instruction for special needs students	4.17

Mostly differences, but some similarities were present in professional development needs of SBAE teachers based on their length of contract. Two items were rated top five in all three groups (a) *teaching problem solving skills*, and (b) *teaching critical thinking skills*. Teachers with a 10 month or 11 month employment contract report needing more assistance with items that directly relate back to the classroom such as (a) *integrating science into agricultural instruction*, (b) *teaching in laboratory settings*, (c) *motivating students*, and (d) *integrating reading strategies into agricultural instruction*. SBAE teachers with 12 month contracts desired more assistance with items related to their personal lives such as (a) *managing stress*, (b) *balancing work and personal life*, and (c) *managing time*. A complete list of professional development needs of SBAE teachers based on their length of contract is found in Table 5.

Table 5
Mean Weighted Discrepancy Scores for Length of Employment

Length of Employment Contract	Item	MWDS
10 months	Teaching problem solving skills	5.39
	Utilizing the Common Core in agricultural instruction	5.25
	Teaching critical thinking skills	4.50
	Integrating science into agricultural instruction	4.04
	Teaching in laboratory settings (ex. land lab, greenhouse, garden, ag mechanics lab, etc.)	3.78
11 months	Teaching critical thinking skills	4.16
	Motivating students	3.59
	Teaching problem solving skills	3.32
	Teaching decision making skills	3.08
12 months	Integrating reading strategies into agricultural instruction	2.90
	Managing stress	4.32
	Utilizing the Common Core in agricultural instruction	4.31

Balancing work and personal life	4.13
Teaching critical thinking skills	3.67
Managing time	3.58

Similarities and differences were present in professional development needs of SBAE teachers located in the eastern, middle, and western regions of Tennessee. Only one item was consistent across all three regions; *utilizing the Common Core in agriculture instruction*. In the Eastern and Western region, three of the same items were ranked top five: (a) *utilizing the Common Core in agricultural instruction*, (b) *managing stress*, and (c) *managing time*. In the Eastern and Middle regions, only one item was rated top five in both groups: *teaching critical thinking skills*. A complete list of top five professional development items based on region is found in Table 6.

Table 6
Top Five Mean Weighted Discrepancy Scores Based on FFA Region

FFA Region	Item	MWDS
East	Utilizing the Common Core in agricultural instruction	4.18
	Managing stress	3.73
	Managing time	3.52
	Teaching critical thinking skills	3.50
	Balancing work and personal life	3.45
Middle	Teaching critical thinking skills	4.13
	Utilizing the Common Core in agricultural instruction	3.74
	Teaching problem solving skills	3.64
	Recruiting students	3.38
	Motivating students	3.17
West	Balancing work and personal life	5.33
	Utilizing the Common Core in agricultural instruction	5.09
	Managing stress	4.90
	Managing time	4.20
	Managing Facilities	4.10

Lastly, in regard to professional development delivery preferences (Table 7), SBAE teachers preferred professional development at the Tennessee summer teachers' conference or as a summer workshop. Few teachers preferred webinars for professional development. One teacher indicated they would prefer professional development to be during the school day and commented that other subjects have professional development during these hours. Lastly, one other teacher indicated they would like professional development to occur on location at their school. A complete list of professional development delivery preferences of SBAE teachers is found in Table 7.

Table 7
Professional Development Delivery Preferences

Delivery Preference	<i>f</i>
Summer conference	99
Summer workshop	83
Webinar	18

Conclusions, Implications, and Recommendations

SBAE teachers in Tennessee are in need of various types of professional development. Overall, SBAE teachers identified their top professional development needs as (a) *utilizing Common Core in agricultural instruction*, (b) *teaching critical thinking skills* (c) *managing stress*, (d) *balancing work and personal life* and (e) *teaching problem solving skills*. Tennessee is a race to the top state, and the pressure to incorporate the Common Core Standards may explain why utilizing the Common Core was the number one professional development need. In addition, being a race to the top state may partially explain the need for professional development in teaching critical thinking and problem solving skills. Authors of the Common Core Standards claim the standards promote higher-order thinking skills (Common Core State Standards Initiative, 2014). Furthermore, the applied nature of agriculture may also partially explain the need for professional development in teaching critical thinking and problem solving. We recommend professional development be developed and offered related to the Common Core Standards, critical thinking, and problem solving. In regard to managing stress and balancing work and personal life, numerous factors such as extended contracts, implementing the total program (FFA, SAE, and instruction), new educational initiatives, and deficiencies in content or pedagogical knowledge may be contributing to this need. Future research should investigate this matter in Tennessee and determine the most appropriate means for reducing stress and work and personal life conflicts. These recommendations should positively impact student success, since understanding teachers' needs are linked to student achievement (Shoulders & Meyers, 2014).

Commonalities and differences were found based on years of teaching experience. Teachers with 0-5 years of teaching experience needed professional development in the area of managing the classroom. This need was not found in the top five of teachers with more than five years of experience. Unique to teachers with greater than 20 years of experience was the need for professional development in fundraising and managing facilities. The most common area of need for teachers with more than five years of experience was *utilizing the Common Core in agriculture education*. The National Research Council (1988, 2009) stated agricultural teachers need to adapt their programs to the changes in education but also in the world of agriculture. New teachers may not have indicated needing assistance incorporating the Common Core standards into their programs, because they gained that specific knowledge and experience at the university level, leaving more experienced teachers behind in the learning process. Additionally, new teachers were the only group to include classroom management as an area of professional development, because they may be more concerned with discipline and developing a constructive learning environment. Further research should be conducted on teachers' knowledge and understanding of utilizing the Common Core in agriculture education.

Furthermore, we recommend professional development workshops be developed to focus directly on helping new teachers with problem solving and critical thinking skills, managing stress during their first years of teaching, strategies for classroom management, and how to effectively manage workload and their personal life. Research should be conducted to measure the professional development effectiveness in these areas to see if new teachers experienced an increase in their ability to teach problem solving and critical thinking skills, manage or reduce

stress, implement effective classroom management strategies, and balance work and personal life. For teachers with 11-20 years of teaching experience, we recommend professional development workshops be developed to help teachers incorporate the Common Core Standards in the classroom, teach their critical thinking skills, strategies for motivating students, as well as strategies for managing time and balancing workload and personal life. Further research should also be conducted to measure the effectiveness of the professional development to determine the effects of Common Core Standards application and evaluate the effectiveness in the agricultural classroom. Finally, we suggest professional development be targeted specifically for teachers with 20 or more years of teaching experience. Experienced and well-seasoned SBAE teachers need professional development in managing facilities and stress, fundraising, motivating their students, and utilizing Common Core Standards in the classroom. Research and further evaluation should be conducted to determine how teachers manage their facilities, stress, keeping students continually motivated, effectiveness of fundraising efforts, and the level at which Common Core Standards were adequately applied in the classroom.

The only unique difference between agriculture education majors and specific agricultural degrees was agriculture education majors' desire help in motivating their students and non-agriculture education majors would like professional development with their teaching of problem solving skills. Due to the findings, professional development may not need to be different for non-agriculture education and agriculture education majors.

However, both male and female SBAE teachers indicated the need for professional development in the areas of (a) *utilizing the Common Core in agricultural instruction*, (b) *teaching critical thinking*, and (c) *balancing work and personal life*. Balancing work and personal life was also found to be an area of concern for female agricultural instructors in Estep et al.'s (2014) study. Professional development workshops that focus on helping agricultural teachers effectively balance their time are needed in order to prevent burnout. Additionally, male agricultural teachers expressed managing stress and managing time as areas of need, whereas females need more assistance in teaching problem solving skills and modifying instruction for special needs students. Based on the differing needs of SBAE teachers, males and females would benefit from having different professional development workshops.

Teacher burnout is a major concern for those entering and currently in the agricultural education profession. When looking at length of contracts, SBAE teachers on a 12 month contract experience a greater need in the areas of stress and time management. These findings could help explain why teacher burnout in the agriculture education profession happens on such a frequent basis. By creating professional development to help SBAE teachers manage their time and stress, teacher burnout could possibly occur at a decreased rate. SBAE teachers who only work 10 or 11 month contracts did not express the need for more stress or time management professional development, but rather they desired help on improving their teaching skills in the classroom, suggesting that once teachers hit that 12th month of teaching there is potential for teacher burnout. Moreover, future research should be conducted to determine the effects of having time off and the relationship to stress management, and if a SBAE teacher's contract contributes to stress.

Numerous similarities and differences exist in professional development needs based on the three different regions in Tennessee. All three regions (East, Middle, & West) indicated a need for utilizing the Common Core Standards in agricultural instruction, further implying that all SBAE teachers need help better implementing these standards into the classroom and professional development should be developed as a solution to this need. The eastern and western regions experienced more professional development similarities such as managing stress, managing time, and balancing work and personal life. Since there were no further similarities between the three regions, it may be beneficial to conduct professional development workshops and in-service based on regional needs rather than assuming professional development needs on a statewide basis.

This study should be replicated to see if the results vary over time. Further research needs to be conducted to determine how to best meet SBAE teachers' professional development needs, and findings from this study suggest demographic variables need to be taken into consideration when developing professional development. This is important because a one size fits all approach to professional development may not be the most effective means of improving SBAE teachers' knowledge and skills, which can directly impact student achievement (Shoulders & Myers, 2014).

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