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USING INSTRUCTIONAL TECHNOLOGIES OUTSIDE THE CLASSROOM: GRAPHING CALCULATORS AND THE TEXAS FFA AGRICULTURAL MECHANICS CAREER DEVELOPMENT EVENT

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Abstract

This study was designed to describe student performance in the Texas FFA agricultural mechanics career development event (CDE) by access to, experience with, and use of a graphing calculator. A census of CDE participants was conducted. Findings of this study show that most participants had access to a graphing calculator. Students in this study perceived that the use of a graphing calculator improved their achievement in mathematics, agricultural science, and science. Students overall, however, did not perceive that they were experts in using a graphing calculator for mathematics, agricultural science, and science. Student classification and graphing calculator ownership were positively associated with higher agricultural mechanics CDE scores.

Introduction

Career development events (CDE's) are an important part of agricultural education. These educational events are organized by the National FFA Organization and state FFA associations, and sponsored by postsecondary education, business and industry, and individuals (Texas FFA, 2009). State rules generally follow national rules, with adaptations for conditions in each state. State CDE activities are based on competencies suggested by the National FFA Organization (National FFA, 2002). Each state association is represented in at least one National FFA CDE. Forty-six states competed in the National Agricultural Mechanics CDE in 2008 (Brown, 2009). Twenty-nine chapters competed in the 2008 Texas FFA Agricultural Mechanics CDE at the state level (Edney, 2009).

Career development events are an opportunity to perform real-world assessment of student skills. Students must develop abilities to solve complex problems to be successful in the workplace (Texas Education Agency, 2003). Career development events in agricultural mechanics are designed to identify students who have developed the competencies and skills needed for success in the constantly changing workplace. Career development events are designed to incorporate the most current teaching technologies. Students must apply a wide range of technologies to be successful in the workplace (Instructional Materials Service, 2002). Ozgün-Koca (2001) stated that instructional programs should enable students to use representations to interpret physical and mathematical situations. The use of technology-based tools in career development events improves student success by enhancing the instructional process (National Research Council, 1988).

Current educational technology includes graphing calculators that are mandatory in Texas for use by high school students in mathematics courses. In addition to access for testing and classwork, students must have access to graphing calculator for homework and extra curricular activities. Nelson (2002) directed school districts to ensure that adequate numbers of graphing calculators are made available to students for high-stakes testing situations. The state education agency has already provided significant funds to districts for the purchase of graphing calculators. Students should have multiple opportunities to work with calculators. Nelson (2001) noted that science assessments also necessitate the use of graphing calculators.

Theoretical Framework

The theoretical framework for this study is grounded by the seminal work of Hembree and Dessart (1986). Their findings established a positive link between use of calculators and increased student achievement and attitudes. Recent meta analyses support Hembree and Dessart's work (Burrill et al., 2002; Ellington, 2003; Roschelle & Gallagher, 2005). A study by Hawkins, Stancavage, and Dossey (1998) found increased use of calculators improved student achievement on standardized tests. The use of calculators enhances students understanding of complex scientific and mathematical concepts by providing them with additional time to focus on the concept and problem (Center for Technology in Learning, 2007; Dossey, McCrone, Giordano, & Weir, 2002). Heller, Curtis, Jaffe, and Verboncoeur (2005) found that access to and use of graphing calculators resulted in higher mathematics test scores.

Students who are competent users of graphing calculators are more successful (Mokros, & Tinker, 1987). Students who solve problems that involve the use of CBL (calculator-based laboratory) probes are able to collect actual data on motion, sound, temperature, and light. Students with greater mathematical ability and experience tend to be more successful in agricultural mechanics CDE's (Johnson, 1991). Data showed that Texas agricultural mechanics students score as well as their peers in end-of-course assessments (Texas Education Agency, 2009). Johnson (1993) found also that the use of a calculator is strongly related to success in the Agricultural Mechanics CDE.career development event.

Teachers who provide opportunities for students to work with graphing calculators increase student success. Opportunities exist for agricultural science teachers to provide this type of instruction. According to the National FFA (2002), approximately 60% of the agricultural science programs in the United States include agricultural mechanics in their curriculum. Simulation-type problems have been shown to be effective vehicles for teaching many concepts of agricultural mechanics (Agnew & Shinn, 1991). Nelson (2002), however, noted many teachers are not familiar with instructional uses of graphing calculators. Nelson also noted that although school districts have graphing calculators on hand, they are used primarily for testing situations.

Graphing calculators are first introduced as a component of standardized assessment in Texas at the 8th grade level. Before this time, math teachers have generally provided their students with opportunities for guided practice. In many cases, science teachers have not provided these same opportunities. This is generally due to lack of familiarity with graphing calculators. Graphing calculator usage is often taught as a math skill rather than a science skill. Gathering data is often perceived as being a science skill, not a math skill. Interpreting the data contained in graphs is more often perceived as a math skill.

Opportunities should be provided for teachers and students to work with graphing calculators across a curriculum (Ozgün-Koca, 2001). Corporate entities are currently making attempts to expand the teacher knowledge base about graphing calculators with a variety of efforts. Texas Instruments (2009), for example, has developed an AgriScience curriculum and provides training to teachers through workshops offered around the country. The Texas Instruments (TI) AgriScience curriculum objectives are: reinforce agricultural education content across disciplines; promote the relevance between science and mathematics; enhance student learning experiences with real world activities; encourage the use of technology and hands-on learning by teachers; enhance student problem solving skills with real world activities; prepare students to use cutting-edge technology; and promote teacher collaboration across the curriculum.

One way to improve student skills is through the use of graphing calculators (Ozgün-Koca, 2001). Opportunities to integrate graphing calculator techniques with real-world application of this technology are provided at several locations. Extending instruction that involves graphing calculators to agricultural science classrooms should not result in budget increases, but will allow districts to make better use of equipment already in place. Research indicates the need for integrated educational activities anchored in real-world frameworks. Oakes (1997) suggested that a method combining discovery science with real-life situations will increase student understanding of calculator use and a greater understanding of science concepts. Balschweid (2002), however, noted that little evidence exists to show that general education teachers support their teaching with real-life examples in agricultural contexts. As early as 1983, the National Science Board recognized the need to incorporate more hands-on science experiences for students (NRC, 1988).

Scientific relevancy could be increased for students that seem to be uninterested with "traditional" approaches to science and mathematics through the use of curriculums that support science and math education (Balschweid, 2002). "Experiential" or problem-based learning may provide a transfer opportunity for many types of students. It has been demonstrated that problem-solving increases student retention. Solving real-world type problems in agricultural science classes incorporates the use of the scientific method and leads to student success (Boone, 1990). Complex calculations are an integral component of the world around us, and are contained in the Agricultural Mechanics CDE. Ozgün-Koca (2001) states that graphs are an effective means of summarizing complex information. Also, understanding and using graphs are a critical skill in the career development process for all students. Gliem and Warmbrod (1986) suggested that the utilization of practical mathematical problems should be an integral component of agricultural mechanics courses.

The 2003 Texas Agricultural Mechanics CDE involved teams of students using graphing calculators to solve problems. Slavin (1995) found that cooperative problem-solving increases student effectiveness. Problem solving with graphing calculators and interaction between team members is an effective method of instruction when the problem is carefully chosen (Grouws & Cebulla, 2000). Students experience greater success when solving problems because concepts and skills can be employed jointly. The agricultural mechanics CDE is an event that is balanced between problem-solving and individual skill performance.

To enhance the mathematical skills of high school agricultural science students, their teachers must become better teachers of mathematics skills. This can be done through the development of teacher opportunities that focus on the application of mathematics to agricultural problems (Miller & Gliem, 1994). A need exists for in-service opportunities that incorporate specific problem-solving skills utilizing graphing calculators. The research presented in this paper is an attempt to expand the work of Johnson (1991, 1993) and Gliem and Warmbrod (1986) within the theoretical framework of Hembree and Dessart (1986) by looking at the impact of student access to, experience with, and use of graphing calculators for testing, class work, homework, and extra curricular activities on achievement in the Texas agricultural mechanics CDE.

Purpose

The purpose of this study was to describe student performance in the Texas FFA agricultural mechanics Career Development Agricultural Event by access to, experience with, and use of a graphing calculator. The objectives of the study were:

1. Describe participants by whether their school allowed them to use their personal graphing calculator or provided them with access to a graphing calculator for standardized testing (Texas Assessment of Knowledge and Skills-TAKS), routine class work, homework, or extra curricular activities.
2. Describe participants by their experiences with graphing calculators.
3. Describe participants by their use of graphing calculators.
4. Describe participants by CDE performance and personal characteristics.

Methods

The research design used for this study was descriptive in nature. The target population was all high school students participating in the Texas FFA agricultural mechanics Career Development

Event. The population consisted of 107 students who qualified for the state event through regional competitions. A census of the defined population was conducted. Data for this study were collected in-person by the researchers during registration at the contest site. Because a census was conducted, analyses of the data are reported as parameters.

The Agricultural Mechanics competition consisted of six parts and students were allowed to use a graphing calculator during the entire competition. The six parts included three individual activities (power and machinery, electricity, agricultural structures), one team activity (problem solving), and two multiple choice examinations (cognitive skills and critical thinking). Competition rules allowed participants to use a graphing calculator on any part of competition. The competition's technical experts indicated that the use of a graphing calculator would likely improve students' scores, minimize mathematical errors, and increase student efficiency. For the team activity, all participants were provided with and allowed to use only TI 83 graphing calculators, which were supplied by TI. The team activity was specifically designed to engage the students in new and challenging situations that involve mathematical concepts (Dossey, McCrone, Giordano, & Weir, 2002). The activity required students to "recognize and formulate the situation in mathematical terms; determine which relationships are necessary and which are sufficient; select relevant strategies, data, and models; use reasoning (spatial, inductive, deductive, or statistical) in new setting; and judge the reasonableness and correctness of outcomes" (Dossey, McCrone, Giordano, & Weir, 2002).

The research instrument was designed to measure participants' access to, experience with, and use of graphing calculators in a variety of in-school and extra-curricular activities. A limitation of this study is that students self-reported their responses. The first part of the instrument was designed to gather information on students' ownership of a graphing calculator (brand and model if known) and school classification. The second part was designed to gather information on students' use of a graphing calculator for standardized testing, routine class work, and extra curricular activities using a nominal scale. The third part of the instrument was designed to gather information on students' experiences with graphing calculators using a five-point Likert-type scale. The points on the scale were: 1=strongly disagree; 2= disagree; 3=neither agree or disagree; 4=agree; and 5=strongly agree. The fourth part of the instrument was used to gather data on students' use of a graphing calculator using a five-point Likert-type scale. The points on the scale were: 1=never; 2=seldom; 3=some; 4=lots; and 5=always. Additional data were gathered on student and team performance upon completion of the competition. Student responses to the instrument were then matched with their individual and team scores.

The instrument was developed with assistance of the Agricultural Mechanics technical experts, judges, and TI AgriScience Academic Coordinator. Content and face validity of the instrument were established by a panel of experts consisting of university faculty, technical experts, and contest judges. Minor wording and formatting changes were made based of the recommendations of the panel.

A pilot study was conducted at qualifying CDE's with 75 students. Reliability for the construct access to a graphing calculator (r=.65), was estimated by calculating a split-half coefficient. Reliability for the section could be increased to .78 by removing the question on access to a graphing calculator on the day of TAKS testing. Based on the researchers need to gather descriptive information on students' access to a graphing calculator on the day of testing, this question was retained. Reliability for the construct student experience with graphing calculators (r=.90) was estimated by calculating a Chronbach's *alpha*. Reliability for the

construct student use of graphing calculators (r=.83) was estimated by calculating a Chronbach's *alpha*.

As a measure of instrument stability, a paired samples t-test was conducted on 33 students participating in the qualifying CDE's and the results of those same students participating in the State CDE's. There were no statistically significant differences between student responses at the qualifying CDE and the State CDE. It appears, therefore, that the instrument is stable. Alpha for all statistical procedures was set *a priori* at .05. The magnitudes of relationships were described using Davis' convention (1971).

Findings

This section presents a summary of findings by objectives. One-hundred seven high school students participated in the event. Approximately 42% of the students were seniors, 42% juniors, 15% sophomores, and 1% freshman. Approximately 42% of the students indicated that they owned a graphing calculator. Of those students indicating they owned a graphing calculator, 37 students reported owning a Texas Instrument graphing calculator and one student reported owning a Casio graphing calculator.

Objective 1

The first objective of this study was to describe participants' by whether their school allowed them to use their personal graphing calculator or provided them with access to a graphing calculator for standardized testing (TAKS), routine class work, homework, or extra curricular activities. Table 1 shows that 93.1% of students indicated that their school allowed them to use a graphing calculator for routine class work, 87.1% for extra curricular activities, 80.6% for homework, and 77.5% for standardized testing.

Table 1

Student Access to Graphing Calculators (*N*=107)

Student Access	Yes		No	
My school allowed me to use my personal graphing calculator or provided me with access to a graphing calculator:	*f*[a]	*%*[b]	*f*[a]	*%*[b]
• for **routine class work**	95	93.1	7	6.9
• for **extra curricular activities** such as CDE	88	87.1	13	12.9
• for **homework**	83	80.6	20	19.4
• on the day of **TAKS testing**	79	77.5	23	22.5

Note. [a]Frequencies may not sum to N=107 due to item nonresponse. [b]Valid percent.

Objective 2

The second objective of this study was to describe participants' by their experiences with graphing calculators. As shown in Table 2, students agreed or strongly agreed with the statement, my teachers have instructed me how to appropriately us a graphing calculator for TAKS testing (66.2%) and extra curricular activities such as CDE (55.9%). Students agreed or strongly agreed with the statement, I am comfortable using a graphing calculator for TAKS testing (77.4%) and extra curricular activities such as CDE (76%). Students provided mixed responses as to their level of agreement with respect to the statement, I think I am an expert in using a graphing

calculator for mathematics (89.3%, disagree, neither agree/disagree, or agree), science (89.3%, disagree, neither agree/disagree, or agree), and agricultural science (86.5%, disagree, neither agree/disagree, or agree). Students agreed or strongly agreed with the statement, the use of a graphing calculator improves my achievement in mathematics (83.3%), science (71.6%), and agricultural science (68.6%).

Table 2

Student experiences with graphing calculators (*N*=107)

Student Experiences	Strongly Disagree		Disagree		Neither Agree or Disagree		Agree		Strongly Agree	
My teachers have instructed me how to appropriately us a graphing calculator for:	*f*[a]	%[b]	*f*[a]	%[b]	*f*[a]	%[b]	*f*[a]	%[b]	*f*[a]	%[b]
• **TAKS testing**	2	1.9	20	19.4	13	12.6	58	56.3	10	9.9
• **extra curricular activities** such as CDE	3	2.9	25	24.5	17	16.7	45	44.1	12	11.8
I am comfortable using a graphing calculator for:										
• **TAKS testing**	0	0	11	10.8	12	11.8	60	58.8	19	18.6
• **extra curricular activities** such as CDE	1	1.0	11	11.0	12	12.0	54	54.0	22	22.0
I think I am an expert in using a graphing calculator for:										
• **Mathematics**	6	5.8	17	16.5	33	32.0	42	40.8	5	4.9
• **Agricultural Science**	7	6.9	22	21.6	32	31.4	37	36.3	4	3.9
• **Science**	9	8.7	24	23.3	36	35.0	29	28.2	5	4.9
The use of a graphing calculator improves my achievement in:										
• **Mathematics**	2	2.0	3	2.9	12	11.8	65	60.8	23	22.5
• **Science**	3	2.9	9	8.8	17	16.7	53	52.0	20	19.6
• **Agricultural Science**	4	3.9	7	6.9	21	20.6	51	50.0	19	18.6

Note. [a]Frequencies may not sum to N=107 due to item nonresponse. [b]Valid percent.

Objective 3

The third objective of this study was to describe participants' use of graphing calculators. Table 3 shows how often students used a graphing calculator in their school classes. Students indicated they used a graphing calculator lots or always in their math classes (59.4%), science classes (30.7%), agricultural science classes (15.9%), and in any/all other classes (8%).

Table 3

Student use of graphing calculators (*N*=107)

Student Use	Never		Seldom		Some		Lots		Always	
How often do you use a graphing calculator in your:	*f*[a]	%[b]	*f*[a]	%[b]	*f*[a]	%[b]	*f*[a]	%[b]	*f*[a]	%[b]
• **Math classes?**	9	8.9	13	12.9	19	18.8	24	23.8	36	35.6
• **Science classes?**	22	21.8	19	18.8	29	28.7	20	19.8	11	10.9
• **Agricultural Science classes?**	26	25.7	26	25.7	33	32.7	12	11.9	4	4.0
• **In any/all other classes?**	33	32.7	29	28.7	31	30.7	5	5.0	3	3.0

Note. [a]Frequencies may not sum to N=107 due to item nonresponse. [b]Valid percent.

Objective 4

The fourth objective of this study was to describe participants' by individual performance and personal characteristics. The maximum individual overall score possible on the Agricultural Mechanics event was 223 points. The maximum individual overall score achieved was 177 points and the minimum individual overall score achieved was 73 points. The average individual overall score was 116.3 points (SD=24.2) with a median score of 110 points. Students (*f*=43) that indicated they owned a graphing calculator scored approximately seven points higher than students (*f*=59) that indicated they did not own a graphing calculator. This point discrepancy translated into an average difference of nine places in the individual judging contest. Approximately 56% of sophomores, 42% of juniors, and 37% of seniors indicated that they owned a graphing calculator. The average score for seniors was approximately 122 points, for juniors 114 points, for sophomores 111 points, and freshman 102 points.

The maximum team activity individual score achieved was 18 points and the minimum score achieved was 0 points. The average team activity individual score was 6.9 points (*SD*=4.6). Students who indicated that they owned a graphing calculator scored approximately one point higher than students who indicated they did not own a graphing calculator.

Table 4

Individual Overall Score and Team Activity Individual Score by Graphing Calculator Ownership and Student Classification (*N*=107)

Graphing Calculator Ownership	*f*[a]	*%*[b]	*Individual Overall Score*[c]	*SD*	*Team Activity Individual Score*[d]	*SD*
Own a graphing calculator	43	42.2	120.0	24.3	7.3	5.3
Do not own a graphing calculator	59	57.8	113.4	24.2	6.7	4.2
Student Classification						
Senior	44	41.9	122.0	26.2	9.0	4.6
Junior	44	41.9	114.1	23.5	6.0	3.9
Sophomore	16	15.2	110.6	19.3	3.6	3.3

Note. [a]Frequencies may not sum to N=107 due to item nonresponse. [b]Valid percent. [c]Maximum score = 177, minimum score = 73, mean score = 116.3, standard deviation = 24.2. [d]Maximum score = 18, minimum score = 0, mean score = 6.9, standard deviation = 4.6.

Seniors, on average placed nine places higher in the judging that juniors, 11 places higher than sophomores, and 26 places higher than freshman. Those seniors who owned graphing calculators scored approximately one point more and one rank better than seniors who did not own graphing calculators. Juniors who owned a graphing calculator scored approximately 14 points more and 18 ranks better than those who did not own a graphing calculator. Sophomores who owned a graphing calculator scored approximately six points more and ten ranks better than those who did not own a graphing calculator.

To address whether individual overall scores or team activity individual scores, that required use of a TI graphing calculator, were related to access to, experience with, or use of a graphing calculator appropriate correlations coefficients were calculated (see Table 5). There were no statistically significant relationships between an individuals overall score and access to a

graphing calculator, $r_{pb}(101) = -.10$, $p > .05$, experience with a graphing calculator, $r_s(102) = .02$, $p > .05$, or use of a graphing calculator, $r_s(99) = .06$, $p > .05$. There were no statistically significant relationships between team activity individual scores and access to a graphing calculator, $r_{pb}(101) = -.17$, $p > .05$, experience with a graphing calculator, $r_s(102) = .01$, $p > .05$, or use of a graphing calculator, $r_s(99) = .05$, $p > .05$.

Table 5
Relationship between Individual Overall Score and Team Activity Individual Score and Access to, Experience with, and Use of Graphing Calculators (*N*=107)

Individual Overall Score	*Correlation*	*Magnitude*
Access to Graphing Calculator	$r_{pb} = -.10$	Low
Student Experience with Graphing Calculator	$r_s = .02$	Negligible
Student Use of Graphing Calculator	$r_s = .06$	Negligible
Team Activity Individual Score		
Access to Graphing Calculator	$r_{pb} = -.17$	Low
Student Experience with Graphing Calculator	$r_s = .01$	Negligible
Student Use of Graphing Calculator	$r_s = .05$	Negligible

Conclusions, Implications and Recommendations

The agricultural mechanics CDE in Texas provides students an opportunity to demonstrate their competence and judges to perform authentic assessments of such competence. Overall student achievement ranged from 79% to 33% with an average achievement of 52%. Johnson (1993) noted that CDE "activities should be challenging and discriminate among contestants while still providing participants with the opportunity to achieve higher levels of success" (p. 44). Overall student achievement provides evidence that the event is both challenging and discriminating.

The Texas Education Agency requires school districts to provide students with access to graphing calculators for testing, class work, homework, and extra curricular activities (Nelson, 2001, 2002). Students, in general, indicated that they had access to a graphing calculator for testing, class work, homework, and extra curricular activities. It is a concern, however, that some students indicated they did not have access to a graphing calculator for such activities. Because of the positive link between student use of calculators and achievement (Hembree, & Dessart, 1986) and the student perception or reality that access and use are not universal, students should be encouraged to purchase a graphing calculator if they do not already own one or if they do not have ready access to one.

Students in this study tended to perceive that the use of a graphing calculator improved their achievement in mathematics, agricultural science, and science. This finding is supportive of Hawkins, Stancavage, and Dossey (1998) and Hembree and Dessart's (1986) conclusions. Students overall, however, did not perceive that they were experts in using a graphing calculator for mathematics, agricultural science, and science. A majority of students indicated that they were comfortable using and had been adequately trained by their teachers to use a graphing calculator for standardized testing and extracurricular activities. Students indicated they were more likely to use a graphing calculator in their math classes than any other classes. An implication exists that overall student achievement could be improved further through additional

training and use across a school's curriculum. A majority of students indicated that they never or seldom used a graphing calculator in their agricultural science courses. An implication exists that a student's overall achievement in CDE events could be enhanced by increasing student use of graphing calculators in agricultural science courses. This implication is supported by the findings of Johnson (1993) and Gliem and Warmbrod (1986).

Student classification and graphing calculator ownership were positively associated with higher agricultural mechanics CDE scores. Student access to, experience with, and use of a graphing calculator were not associated with achievement on the CDE. A limitation of this study was that there was not a control variable for actual use of a graphing calculator on the agricultural mechanics CDE contest. Future studies on this topic should attempt to control for actual use of a graphing calculator during a portion of the contest. To ensure students are not disadvantaged by being placed in the control group (which would be predicted), a non judged activity could be scheduled at the end of the contest. Research should also include questions on participant access to and use of a graphing calculator during the contest. Additional measures of access to a graphing calculator may improve the reliability of this section of the questionnaire.

The results of this study may be useful in improving the agricultural mechanics CDE. In addition to incorporating the most up-to-date agricultural mechanics technologies into the contest, technical experts need also to ensure that CDEs take advantage of new and emerging educational technologies that are associated with deeper and more meaningful student learning experiences. While the literature and findings of this study highlight the relationship between student achievement and use of graphing calculators, future research should also address other emerging technologies that may also be related to student achievement. Emerging technologies include global positioning systems, personal digital assistants, mobile computing laboratories, point-to-point video conferencing, expert systems, 3D and virtual modeling, bar coding, total station systems, and lasers. By merging these technologies into the CDE, deeper and more meaningful learning experiences may be produced.

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MASTER GARDENERS' TEACHING EFFICACY AND DEMOGRAPHIC CHARACTERISTICS AS VOLUNTEER EDUCATORS FOR COOPERATIVE EXTENSION

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Abstract

Cooperative Extension needs a consistent corps of volunteers to deliver organizational objectives. Extension agents should develop an understanding of volunteer motivations in order to identify and retain those individuals. The theoretical framework of this study was based on self-efficacy theory. The purpose of this study was to develop an understanding of the teaching self-efficacy of Master Gardeners. The questionnaire included the instructional efficacy construct from the Teacher Sense of Efficacy Scale (TSES) and questions about participant demographics. The response rate was 74.15%. The majority of participants were mainly women, white, earned some type of higher education degree, and nearly half of the participants were 56 years old or older. Adults felt "Some Influence" in their effective teaching duty as a volunteer educator in the Master Gardener Program. Retaining quality Master Gardeners may increase the effectiveness of Cooperative Extension.

Introduction

Volunteers are individuals searching for information while cooperating with individuals or organizations with mutual interests (Rost, 1997). Kirsch and VanDerZanden (2002) suggested researchers develop an understanding of the characteristics of Master Gardener volunteers on a state by state basis due to the lack of a standard national program. Extension should utilize trained Master Gardeners in as many volunteer opportunities as possible for several years in order to receive a good return on their investment (Meyer & Hanchek, 1997; Swackhamer & Kiernan, 2005). An adult who is secure and self-confident with the volunteer responsibility is more likely to remain involved in the Master Gardener Program (Swackhamer & Kiernan). The National Research Agenda suggests extension faculty identify the needs and competencies of stakeholders in nonformal agricultural extension education (Osborne, n.d.).

The mission of the Tennessee Master Gardener program is to educate participants as volunteer educators of The University of Tennessee Extension and the Tennessee State Cooperative Extension Program by providing home gardeners with researched-based knowledge (Reiners, Nichnadowicz, Nitzsche, & Bachelder, 1991). In Tennessee, there are approximately 2,000 active adult Master Gardeners that serve 46 of the state's 95 counties. Once their education is finished, adults are required to donate 25 volunteer hours annually to remain certified as a Tennessee Master Gardener. Master Gardeners' volunteer time provides them experiences and opportunities to interact with others through their teaching experiences (Flagler, 1992). Master Gardener participants are typically older white women (Meyer, 2004; Rohs, Stribling, & Westerfield, 2002; Sutton, 2006). However, little research exists as to their level of education, income, and length of tenure in the program. Research is needed on Master Gardener's instructional efficacy due to a deficiency on the topic. This study attempts to alleviate a portion of this deficiency.

A need exists for volunteers throughout Cooperative Extension. Hoover and Connor (2001) indicated volunteers are significant components of each Extension program area. Master Gardener volunteers stretch the reach of Cooperative Extension (Swackhamer & Kiernan, 2005). As Extension programs at land grant institutions throughout the nation have continued to face budget deficits and decreased funding, the role of the Extension volunteer has become increasingly more significant for the organization to provide reliable services to the general public (Steele, 1994). A continuous stream of volunteers is essential to the operation of Extension objectives (Smith, 2005). Stouse and Marr (1992) suggested that Master Gardener volunteers serve as walking advertisements for the program.

Training volunteers accurately, and providing the right type of experiences for volunteers, may allow adults to feel motivated to carry on with their volunteer service (Corporation for National and Community Service, 2006). An agent must have an understanding of what appeals to and motivates volunteers in order to effectively recruit, train, and retain these volunteers (Boyd, 2004). National statistics have revealed that, on the average, one out of three volunteers discontinue volunteering after one year of service (Corporation for National and Community Service, 2006). Boyd recommended staff members and administrative personnel must be aware

of the factors that contribute to successful volunteer commitment and adapt their management strategies to align with these factors in order to better recruit, prepare, and retain these adults.

Theoretical Framework

The theoretical framework of this study was based on self-efficacy theory (Bandura, 1993). Self-efficacy theory is the extent beliefs regarding the capacity to control the performance and incidents that influence their lives (Bandura, 1993). The affect of self-efficacy contributes to an adult's motivation to participate in an activity. Self-efficacy will impact how adults cogitate, form opinions, inspire themselves, and act (Bandura, 1997). Tschannen-Moran and Woolfolk Hoy (2001) suggested educator self-efficacy describes an instructor's confidence in his/her aptitude to bring about learner engagement and learning outcomes including difficult learners.

Adults confident in their abilities address complex undertakings as opportunities to be successful (Bandura, 1997). Success encourages their interest and engages individuals in endeavors. High self-efficacy adults establish lofty goals and sustain a robust obligation to those goals. Also, these individuals devote enhanced efforts in their duties and improve their efforts in the appearance of letdowns. High self-efficacy individuals consider advantages by continuing to be task oriented in times of trials, and accredit letdowns to inadequate efforts. High self-efficacy individuals are success oriented and thus promptly recuperate their feeling of efficacy after letdowns (Bandura, 1993). These individuals address perils believing they can manage them. These attributes of self-efficacy operationally contribute to individual accomplishments.

Master Gardeners utilize their knowledge and skills to teach clientele (Peronto & Murphy, 2009; Rohs & Westerfield, 1996). Knobloch and Whittington (2002) found collective efficacy was theoretically and operationally similar to teacher efficacy. Teaching in a setting similar to what students would encounter professionally improved their teaching efficacy (Knobloch, 2001). Self-efficacy was the influential variable that characterized individuals who succeeded as a secondary agricultural education teachers (Kelsey, 2007). Student teachers felt more efficacious about their teaching efficacy after their opportunity to student teach (Knoblach, 2002; Roberts, Harlin, & Ricketts, 2006; Stripling, Ricketts, Roberts, & Harlin, 2008). If preservice teachers are better educators after their teaching efficacy is improved, then Master Gardeners may remain active and be more proficient and effective in their roles as volunteer educators if they possess high self-efficacy in teaching.

Purpose and Objectives of the Study

The purpose of this study was to develop an understanding of the teaching self-efficacy of Master Gardeners. The primary objectives of the study were to:

1. Describe participant demographics in the Master Gardener Program.

2. Describe Master Gardeners' efficacy in instructional strategies as volunteer educators.

Methodology

The findings are part of a larger study conducted to develop an understanding of factors related to the enrollment and retention of Master Gardeners. It was a descriptive study using a census of participants from one county's Master Gardener Program in Tennessee. The portion of the study reported here focused on the teaching self-efficacy of Master Gardeners. Quantitative research was selected as the research design for this study. Eighty-nine adults served as volunteer educators for the local Master Gardener Program.

Survey research employs questionnaires to gather data from the population. Ary, Jacobs, Razavieh, and Sorenson (2006) explained survey research allows the researcher to condense the results of characteristics of dissimilar groups in order to assess their attitudes and opinions. The questionnaire included the instructional efficacy construct from Tschannen-Moran and Woolfolk Hoy's (2001) Teacher Sense of Efficacy Scale (TSES) and questions about participant demographics. The TSES was derived from Bandura's (1993) self-efficacy theory. On the instructional efficacy construct of the TSES, respondents were asked "How much can you do?" with a scale of: 9 = *a great deal*, 7 = *quite a bit*, 5 = *some influence*, 3 = *very little*, and 1 = *nothing*. Reliability for the instructional efficacy construct of the Teacher Sense of Efficacy Scale was calculated ex post facto at .94. National norms or anchors for the TSES do not exist.

The researchers utilized the methods outlined by Dillman, Smyth, and Christian (2009) to increase response rate from participants when instituting a mail questionnaire. The data collection instrument was printed in a booklet layout and then mailed to the sampled population. Eighty-nine participants were surveyed and 66 participants returned their completed surveys to the researchers. Thus, the response rate was 74.15%. Early and late respondents were compared and no significant differences existed, therefore the results may be generalized to the target population (Lindner, Murphy, & Briers, 2001).

Descriptive statistics were selected to analyze the study's objectives. Descriptive statistics determine attributes of different groups in order to measure their attitudes toward a specific item (Shavelson, 1996). A limitation of the study is the selection of Master Gardener adult participants in Putnam County, Tennessee. The target population may not be characteristic of other adult Master Gardeners or Master Gardener programs in other states. This limits the ability to generalize the findings of the study.

Findings

The first objective was to describe the demographic characteristics of the local MG participants. Women accounted for 83.33% of the respondents, and all but one respondent was white. Forty-six percent of participants were 56 years of age or older. Also, 74.24% of participants had obtained at least an Associate's Degree. Participants' annual income tended to be between $25,000 - 49,999. Over 58% of respondents had participated in the program over 2 years.

Table 1

Participant Demographics

Characteristic	*f*	%
Gender		
Female	55	83
Male	11	17
Ethnicity		
African American	0	0
Asian	0	0
Hispanic	0	0
Native American	0	0
Pacific Islander	0	0
White	65	99
Other	1	1
Age		
18 – 34 years old	1	2
35 – 45 years old	17	26
46 – 55 years old	18	27
56 – 65 years old	22	33
66 years or older	8	12
Education		
High School Diploma or Equivalent	17	26
Associate's Degree	14	21
Bachelor's Degree	19	29
Master's Degree	13	20
Doctoral Degree	1	2
Professional Degree	2	3
Income		
$24,999 or less	3	5
$25,000 to $49,999	37	55
$50,000 to $74,999	19	29
$75,000 to $99,000	6	9
$100,000 or more	1	2
Tenure in Master Gardener		
More than One Year	28	42
2 – 4 years	31	46
5 – 10 years	8	12
11 or more years	1	2

The second objective of the study reported here was to describe Master Gardeners' efficacy in instructional strategies as volunteer educators. Table 2 illustrates the descriptive statistics for the instructional efficacy construct. The highest mean occurred for the question, "How much can you do to adjust your information to the proper level for individual clients?" (M = 6.18, SD = 2.05). The lowest mean was associated with the question, "How much can you gauge client comprehension of what you have taught?" (M =5.59, SD = 2.00).

Table 2

Descriptive Statistics for the Instructional Efficacy Construct

	N	*M*	*SD*
How much can you do to adjust your information to the proper level for individual clients?	66	6.18	2.05
To what extent can you provide an alternative explanation or example when clients are confused?	66	6.06	1.95
How well can you implement alternative strategies in your teaching?	66	5.92	2.08
How well can you respond to difficult questions from your clients?	66	5.73	1.87
How comfortable are you using evaluation strategies?	66	5.73	2.16
To what extent can you craft good questions for your clients?	66	5.64	1.93
How much can you gauge client comprehension of what you have taught?	66	5.59	2.00

Note: Overall M = 5.84, SD = 1.72. Scale: 9 = a great deal, 7 = *quite a bit,* 5 = *some influence,* 3 = *very little,* and 1 = *nothing.*

Conclusions and Implications

The Master Gardener program in the county studied appealed to a very specific demographic. The majority of participants were educated white women of moderate affluence that were approaching or at retirement age. They had been involved in the program slightly over three years. The participants' characteristics in this study were similar to other studies involving Master Gardener characteristics (Meyer, 2004; Rohs, Stribling, & Westerfield, 2002; Sutton, 2006). Most participants indicated they had "Some Influence" over their instructional self-efficacy as volunteer educators in the Master Gardener Program.

The fact that participants were relatively well-off, older adults implies they were more likely to have more free time than younger adults. This population was primarily female and similar to other studies' gender findings of MG participants (Meyer, 2004; Sutton, 2006). This information could assist researchers who focus on the effect of gender on volunteerism to better understand participation. Also, the subject matter involved in the MG program may entice more women than men to participate. The population was largely white which is consistent with the population of Putnam County, Tennessee.

Master Gardeners can serve as a vital resource for Extension to fulfill its mission as the educational outreach component of the land-grant university. Retaining high quality Master Gardeners can assist Extension in increasing organizational effectiveness and reducing the cost of the program (Schrock, Meyer, Ascher, & Synder, 2000). The Corporation for National and Community Service (2006) suggested preparing volunteers correctly, and offering a realistic variety of events, may motivate adults to continue with their volunteer service. In order to accurately and efficiently recruit, educate, and retain this asset, Boyd (2004) recommended

extension agents should develop an understanding of the aspects that encourages volunteers to participate.

The respondents in this study were homogenous. Cooperative Extension should strive to identify, recruit, and train a more ethnically diverse group of adults as volunteer educators for the Master Gardener Program. However, it is unrealistic for the county program included in this study to accomplish this due to the vast majority of the local population being white. Other local demographic factors should be considered as well such as age, education, and income.

Self-efficacy plays a role s in an individual's motivation to participate in activities. Bandura (1993) defined adults with high self-efficacy as performance oriented and recover self-efficacy quickly after disappointments. Participants in this study had a moderate level of instructional efficacy. Therefore, opportunities exist for Master Gardeners' instructional efficacy to be enhanced or decreased. This would address Bandura's recommendation to improve participants' cognitive and affective efficacy. Tschannen-Moran and Woolfolk Hoy (2001) suggested individuals are motivated to be successful in their experiences when instructional efficacy is high, and individuals become frustrated and seek other opportunities when instructional efficacy is low. An objective of the local Master Gardener Coordinator should be to enhance this group of Master Gardeners' current level of instructional efficacy. An adult who has efficacy with his/her volunteer duties is more likely to continue his/her participation in the Master Gardener Program (Swackhamer & Kiernan, 2005). The average tenure for adults in the program was slightly over three years. The group might have more efficacy in instructional strategies if they had been Master Gardeners longer. Conversely, instructional efficacy could be lower if their experience was less than three years.

Teacher self-efficacy is an educator's belief in his/her capability to manufacture student engagement and student outcomes (Tschannen-Moran & Woolfolk Hoy, 2001). Bandura (1997) suggested success give confidence to high self-efficacy adults in creating advanced objectives and the ability to sustain a vigorous commitment to objectives. The linkage between these two studies is the features of individuals with high teaching self-efficacy seek challenging objectives and are committed to achieving those objectives. Bandura refers to this as motivational efficacy. Adults with low motivational efficacy may terminate their participation in the endeavor (Bandura).

Instructional efficacy is important for Master Gardener participation due to Cooperative Extension's need for volunteers and specifically those that can serve as effective volunteer educators for their local MG Program. Participants in this study possessed average instructional efficacy and thus it is unlikely they would have a robust obligation to the goals of the program (Tschannen-Moran & Woolfolk Hoy, 2001). Relf and McDaniel (1994) suggested the objectives of MG are to allow adult volunteers to support Cooperative Extension in teaching research-based horticultural information to local citizens. Cooperative Extension should be concerned if Master Gardeners have average or low self-efficacy due to the probability of less effective instruction to clientele and the likelihood those Master Gardeners will discontinue their participation.

Recommendations

Very little research has been conducted on the teaching efficacy of volunteer leaders. This study attempted to alleviate a portion of the deficiency. More comprehensive research on Master Gardener participation is needed. A larger study of Master Gardener participants would help determine if specific demographic characteristics dictate which individuals possess more instructional efficacy than others. According to Schrock (1999), demographic characteristics alone cannot be used to predict prolonged participation in the Master Gardener program. More rigorous research is needed to learn why adults continuously participate in the Master Gardener Program.

This study identified areas extension faculty can work to enhance teaching competencies of stakeholders in nonformal agricultural extension education (Osborne, n.d.). In order to increase participants' teaching efficacy, local Master Gardener Coordinators should provide more time training their Master Gardeners how to educate their clientele. A professional development program targeted to Master Gardeners in the area of instructional teaching and learning strategies may lead to enhanced teaching efficacy of participants. Master Gardeners that have a high sense of teaching efficacy could serve as mentors for adults just beginning their involvement in the program or to assist those with low teaching efficacy. This approach may assist Cooperative Extension in retaining effective Master Gardener volunteer educators.

Preservice agriculture teachers viewed themselves as having the highest efficacy in instructional practices after their student teaching experience (Roberts et al., 2006; Stripling et al., 2008). Master Gardener Coordinators could provide initial teaching experiences for Master Gardeners in order to enhance their instructional efficacy prior to teaching clientele solely on their own. These initial teaching experiences could be monitored by their mentor, someone else determined to have high teaching efficacy, or the Master Gardener Coordinator. Opportunities for adults to teach clientele while beginning their Master Gardener involvement could improve their teaching efficacy over the long-term. Also, these experiences could identify which adults already feel efficacious in their teaching and thus assist the Master Gardener Coordinator in assessing new Master Gardener participants' instructional efficacy.

Opportunities to "practice teaching" may be a method to enhanced instructional efficacy. Knoblach (2002) reported teachers may have felt efficacious in their teaching and their student teaching experiences confirmed their beliefs. Research is needed to identify opportunities in Master Gardener programs that are implemented in order to enhance participants' instructional efficacy. Future research should determine the advantages of those field experiences.

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A QUALITATIVE ANALYSIS OF ALTERNATIVELY CERTIFIED AGRICULTURAL EDUCATION TEACHERS ON THEIR FIRST YEAR OF EMPLOYMENT IN THE TEACHING PROFESSION

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Abstract

This qualitative study sought to describe the perceptions of first-year Oklahoma AC teachers regarding their epistemological beliefs of effective teaching using the Dunkin and Biddle (1974) model as a frame for collecting and analyzing data. Data were collected from six AC teachers who participated in in-depth, face-to-face interviews regarding their epistemological beliefs related to effective teaching. Additionally, these AC teachers participated in a resident teacher program designed to assist first-year teachers in perfecting their trade. Findings indicated that effective teachers control the classroom, motivate students, explain concepts clearly, relate content to students' lives, find ways to engage students, make learning fun, and care for students. Most of these teachers emphatically felt they were effective in the classroom, and they had their own rationale for their epistemological beliefs. However, in contrast to what is known about excellence in the classroom, none of their beliefs dealt directly with student achievement. Results of this study support current efforts in professional development and credit courses for these teachers, which concentrate on the pedagogical and methodological skills needed to meet students' needs as it relates to hands-on classroom and laboratory instruction.

Introduction/Theoretical Framework

Teacher shortage is a current issue facing school systems in America (Hess, 2000; Ruhland & Bremer, 2002). There are not enough certified teachers, and the demand for highly qualified school-based teachers is as strong as ever (Feistritzer & Haar, 2008; Good, McCaslin, Tsang, Zhang, Wiley, Bozack, & Hester, 2006). This problem has been recognized in all domains of teaching with the greatest demands in the areas of math and science (Hess, 2000). Additionally, the need for agricultural education teachers in America has not escaped the phenomenon (Camp, Broyles, & Skelton, 2002; Kantrovich, 2007).

Although the need for additional qualified teachers continues to escalate, teacher training institutions are struggling to produce the quantity of teachers needed to fill the voids created by retirement and attrition (Steadman & Simmons, 2007). Lynch (1996) pronounced, "Colleges and universities have diminished greatly their capacity to produce teachers for our nation's systems of vocational and technical education" (p. 12). As such, alternatively certified (AC) teachers are being employed in public education systems to help meet this need (Rocca & Washburn, 2006).

Historically, the main purpose for alternative certification in education was to offset the shortage of teachers across the country (Shoho & Martin, 1999). Feistritzer and Haar (2008) stated, "Alternative route programs, by their very nature, are established to meet specific needs for specific teachers in specific subject areas in specific schools" (p. 26). Today, virtually every state has an alternative certification program for teachers (Darling-Hammond, 2000; Feistritzer & Haar, 2008; Lynch, 1996; Walsh & Jacobs, 2007). However, alternative certification has not necessarily resulted in success. In fact, the dedication of AC teachers has been called into question. Shen (1997) found AC teachers did not believe teaching would be their lifelong career and as such did not intend to retire in the teaching profession. A study by Rocca and Washburn (2006) supported Shen's findings by pronouncing ". . . alternatively certified teachers are typically those who pursue agriculture teaching as a second career choice" (p. 66). Further, Littleton and Larmer (1998) determined that AC teachers in Texas experienced greater attrition rates than did their traditionally certified counterparts. A reason for the lack of dedication could be due to the misconception that teaching is easy (Lortie, 1975). However, Joerger and Boettcher (2002) stated, ". . . teaching may be one of the most difficult of all professions to master" (p. 587).

Ruhland and Bremer (2002) recognized that AC teachers oftentimes bring industry experience with them to the classroom. In fact, the reasons individuals enter the teaching profession via alternative routes consist of having a change of career interests and the amount of time and effort devoted to obtaining a teaching degree via the traditional route (Davis, Impara, Launey-Rodolf, & Dahlem, 2006).

Because of the emergence of AC teachers, quality has been called into question. Feistritzer and Haar (2008) concluded, "The national challenge is for the states to achieve highly qualified teachers in every classroom" (p. 164). Yet, understanding what teachers should know and be able to do to be effective at their trade is not an easy task. Hess (2000) stated, "Currently, there is no canon for educators. There is some agreement on what teachers should know but no

consensus on how to train good teachers or ensure that they have mastered essential skills or knowledge" (p. 169).

Rosenshine and Furst (1971) defined clarity, variability, enthusiasm, being task oriented, and providing students an opportunity to learn as the criterion characteristics of effective teachers. Roberts and Dyer (2004) found that to be an effective, agriculture teachers should focus on the following eight categories: instruction, FFA, SAE, building community partnerships, marketing, professional growth/professionalism, program planning, and personal qualities (p. 93). However, the authors also pointed out that "being an effective agriculture teacher goes beyond classroom teaching" (p. 94).

Davis et al. (2006) found that AC teachers in Oklahoma perceived their most important needs were in the areas of "classroom management, time management, content knowledge, discipline/behavior management, and providing additional support to students with special needs" (p. 16-17). Lynch (1996) maintained vocational and technical education teachers need to have "knowledge of the learner, pedagogy, instructional technology, and professional education" (p. 17). Lynch (p. 18) further stated,

> Knowledge in this broad professional education category ranges from the ability to manage such highly touted technical skills as preparing lesson plans, assessment instruments and processes, and software packages to evaluating research in human learning and development, cognition, and classroom socialization. It includes drawing on subject matter, general education, and learning theory to develop curriculum, choose diverse methods to match the learning styles of diverse students, and to anticipate results.

It is important to understand how teachers develop their knowledge of teaching and learning (Hofer & Pintrich, 1997). Specifically, Young and Edwards (2006) asked the question, how do AC teachers perceive and come to know what good teaching consists of since they may not have created mental images of effective teaching due to a lack of pedagogical experience (i.e., courses in theory and student teaching)?

Epistemological beliefs theory is a form of constructivism (Darling-Hammond & Bransford, 2005; Korthagen & Kessels, 1999) and serves to assist people in discovering how they come to know and make meaning of their experiences (Hofer & Pintrich, 1997). "Epistemology is an area of philosophy concerned with the nature and justification of human knowledge" (Hofer & Pintrich, 1997, p. 88). Wideen, Mayer-Smith, and Moon (1998) concluded novice teachers have mental images of what effective teaching looks like. To account for these mental perceptions, Korthagen and Kessels (1999) developed a conceptual model concerning the learning process and development of novice teachers and the images they have concerning the teaching and learning process. This model begins with the ways in which novice teachers visualize their experiences (Gestalt). Once teachers have a mental picture of what they are doing, they can be influenced at the Gestalt level by an authority figure (e.g., teacher educator) and be encouraged to consider their prior knowledge per the teaching and learning process to determine certain schemas that will help them be more successful in the classroom. These schemas are based upon what the teacher perceives to be effective and ineffective strategies which aid or hinder the

students' ability to understand the material presented. Once schemas are developed, the teacher can then begin to relate their actions to theory.

Further, the Dunkin and Biddle (1974) model developed to study classroom teaching was used to categorize AC teacher responses. Their model suggested teachers encounter four variable categories: presage, context, process, and product. Specifically, presage variables consist of how a teacher's former experiences affect their behavior and ability to teach. Context variables relate to the types of students in which a teacher inherits and the environment in which he/she practices. Process variables involve the interaction between the teacher and the students during the teaching and learning process. Lastly, product variables encompass student achievement related to the learning environment. Therefore, using Dunkin's and Biddle's (1974) variables as a frame, what are AC teachers' epistemological beliefs regarding effective teaching?

Purpose and Objectives

The purpose of this qualitative study was to describe the perceptions of first-year Oklahoma AC teachers regarding their epistemological beliefs of effective teaching using the Dunkin and Biddle (1974) model as a frame for collecting and analyzing data. The following research questions guided the study.

1. What experiences do AC teachers bring to the classroom?
2. How do AC teachers believe they learn best as opposed to how they believe their students learn best?
3. What is the preferred teaching style of AC teachers?
4. What do AC teachers perceive the qualities and traits of effective teachers to be?
5. What is the perceived level of teaching effectiveness of first year AC teachers?

Methods

The study used qualitative methods to collect and analyze data. Dooley (2007) posited with qualitative research, ". . . the research design is emergent and flexible, the sample size is small, and the researcher spends considerable time in the natural setting" (p. 34). Merriam (1995) stated qualitative research can be used for all the following reasons:

> Clarifying and understanding phenomena and situations when operative variables cannot be identified ahead of time; finding creative or fresh approaches to looking at over-familiar problems; understanding how participants perceive their roles or tasks in an organization; determining the history of a situation; and building theory, hypotheses, or generalizations. (p. 52)

This study focused on all first-year Oklahoma AC teachers (N = 6) in which the researcher was serving as the university supervisor on the resident teacher (RT) committee. The RT committee is Oklahoma's version of an induction program designed to assist first-year teachers. Three individuals (principal, mentor, and university supervisor) serve on the RT committee to assist the first-year teacher during the entry year. These individuals observe the resident teacher three times throughout the course of the academic school year and offer feedback, support, mentorship, and suggestions for improvement. At the end of the academic year, once all

committee members have made their observations, a committee meeting is scheduled to inform the teacher of his/her status. A recommendation is then made by the committee to either "pass" the teacher and allow him/her to achieve full licensure or to "repeat" the RT program for another year.

Data used for this study consisted of field observations and interview responses to a semi-structured protocol. The researcher personally visited each of these teachers three times during the 2007–2008 academic year. Each visit resulted in the researcher observing the RT teach between two and four class periods. On average, the researcher conducted 10 hours of classroom observation per teacher. Each teacher was observed in September, February, and April.

The open-ended interviews occurred with each teacher at the end of the school year once all committee meetings had been finalized. Specifically, the interview protocol was developed by the researcher. For consistency, the researcher conducted and transcribed (verbatim) all interviews to identify emerging patterns and themes (Patton, 2002). Member checks were achieved for credibility (Merriam, 1995) by submitting the transcriptions, via e-mail, to the teachers to verify the data were accurate (Dooley, 2007). Dependability, which refers to the reliability of the data over time, (Guba & Lincoln, 1989) was accounted for by adhering to a rigorous set of guidelines during each interview session. To ensure confirmability of the data (Guba & Lincoln), the researcher accounted for personal bias by monitoring the data throughout the entirety of the study. Specifically, the researcher maintained accuracy of the data by considering each teacher's response on every question asked through conducting a line-by-line analysis of the transcribed data.

The participants were instructed to respond to questions from the interview protocol, which allowed participants to expound upon their thoughts and elaborate whenever necessary. Additional probing questions were asked to the participants to help clarify the responses. The researcher tape-recorded the interviews and took handwritten field notes throughout, which were compared with interview responses as a means to triangulate the data for credibility and dependability (Merriam, 1995).

Further, themes were used to more adequately reflect the findings of the study (Dooley, 2007). Specifically, the themes were framed on the four categories of variables according to the Dunkin and Biddle (1974) model (i.e., presage, context, process, and product).

Findings

Of the six participants, four were male and two were female (Table 1). One male worked in a two-teacher department and the remaining five worked in a single-teacher department. Three AC teachers held academic degrees in agricultural education, leadership, and professional service (non-teaching option), one had a degree in agribusiness, one had a degree in agricultural communications, and one had a degree in animal science.

Table 1

Profile of First Year Secondary Alternatively Certified Agricultural Education Teachers during the 2007-2008 Academic School Year

Teacher No.	Sex	Academic Degree
1	Female	Agricultural Education, Leadership and Service
2	Female	Agricultural Education, Leadership and Service
3	Male	Animal Science
4	Male	Agricultural Education, Leadership and Service
5	Male	Agricultural Communications
6	Male	Agribusiness

Theme: Context Variables

AC teachers had mixed prior work experiences that they brought to the classroom.

As for work experience, four of the six respondents had worked at another job prior to becoming agriculture teachers (#1, 2, 3, 4). One worked for the Oklahoma Water Resources Board (#4), one was an insurance agent (#2), one was a 4-H extension educator (#1), and one split time between managing his family's show horses and working for his in-laws' fire protection company (#3). All four of these participants acknowledged that their work experience helped them in the classroom. The former 4-H educator noticed a strong similarity between her former job and being an agriculture teacher. She stated,

> I feel like the biggest challenge as an ag teacher is you're not only teaching in a classroom, four or five different subjects a day, but you're also doing all your programming. And so, on the 4-H side, I had a year to get my programming down really organized and get a system where I could be effective . . . . And so when I transitioned to Ag Ed, I was already effective at my programming. I just had to get my teaching, my lesson plans and everything, down to where I could do that every day.

Participant #2 also realized the similarities to her former job and teaching, especially as it related to people skills. "It kinda helps you actually be able to relate to the parents. You know, dealing with irate customers kinda is about the same thing as dealing with parents."

When asked why they decided to become teachers, three of the six participants responded because of their love for youth (#1, 3, 6). Two participants responded that it was fate that drew them to the teaching profession (#1, 5). The participants acknowledged that they recognized there was a shortage of teachers and that an opportunity existed, and as such, felt compelled to "answer the call of duty," at least until the shortage crisis seized. Participant #5 stated:

> I had a school board member call for several months. I was in a tight spot, and I guess I'd always thought about being an ag teacher but never really entertained the thought. But he was persistent in calling for six months asking me to become an ag teacher.

Participant #6 alluded to the fact that he was providing a service to the profession by filling a void. He stated his desire was to teach for 5-10 years until the surplus of agricultural education teachers was "back up and running" and that whenever he believed the surplus of teachers was at an adequate level, then he would be willing to move on.

When asked why they did not major in agricultural education (teaching option), two respondents indicated two primary reasons: 1) they could not afford to student teach; 2) their initial career plans changed. In regard to the cost associated with obtaining a degree in agricultural education (teaching option), participant #1 explained:

> I didn't feel like I'd be able to afford to live for a semester doing my student teaching without being paid. I was married and I couldn't go 50 miles away . . . , and . . . I really couldn't afford to go a whole semester without working.

Another participant (#4) indicated he had completed all of his teacher education requirements, minus student teaching, when an industry opportunity came about that made him second guess his desire to teach. He stated that with the job offer, he began to look for ways to graduate early. As such, the student teaching experience was nullified, and he, in turn, graduated with a professional service degree and went to work.

Theme: Presage and Process Variables

AC teachers reported that, to a large degree, they are "hands-on" learners (a presage variable). These teachers also acknowledged that the majority of their students enjoyed hands-on instruction (a process variable). Yet, AC teachers admitted that most of their instruction is based on teacher-centered methods and activities.

When asked to describe their preferred learning styles, participants listed the following basic responses: three (#3, 5, 6) indicated they were hands-on (tactile/kinesthetic) learners, one (#2) was an auditory learner, one (#1) indicated she likes to "hear it, see it, and then do it", and one (#4) indicated he learns best from mistakes he made and later corrected. When asked how their students learn best, the participants revealed that students preferred hands-on learning. However, respondents were quick to point out that their preferred teaching style was a basic PowerPoint® lecture. Even though the primary source of content delivery was conducted through lecture, the respondents seemed to understand the need to get their students involved in the learning process. One participant (#6) explained,

> No kid really wants to sit here and take notes all day. They don't come to ag class to sit here and take notes like they do in math. They want to go and play in soil and they want to plant a plant versus just read about it in the book all day.

This respondent went on to say, "Our attention span is not geared for an hour and a half of complete curriculum." He indicated a good balance is 30 minutes in the classroom learning about a topic and 20 minutes applying the knowledge learned. Another participant (#2) explained that her teaching style consisted primarily of using SmartBoard® and showing students PowerPoint® notes. She went on to say that she needs to adjust her teaching style and delivery of the content to be more effective for her students.

When asked to describe effective teachers, these participants responded that effective teachers do all of the following: control the classroom, motivate students, explain concepts clearly, relate content to students' lives, find ways to engage students, make learning fun, and care for students. Said one participant (#5), "I think an effective teacher needs to make their students feel important - every student - not just a select few, and sometimes that is hard to do." Additionally, it was suggested that effective teachers are approachable and attempt to make students feel safe in the learning environment by working with them individually. Participant #2 said, "Sometimes

those kids just need a one-on-one where they don't feel peer pressured to not ask a question. If it's just one-on-one, they'll ask the question [and] then they'll learn more."

Theme: Product Variables

AC teachers reported that their mental images of effective teachers are those who cared about them as individuals. Specifically, these "mental models" were teachers who spent extra time explaining subject matter and making themselves available for their students for extra help.

Participants were asked to describe effective teachers who had made an impression on them. Some of the participants recalled teachers they had experienced in the past and related why they tried to model and emulate these individuals. One participant (#2) responded that her math teacher was an example of an effective teacher because she was willing to work with and assist students, individually, after hours if need be, and she was able to show students how to work a problem in multiple ways. Another participant (#5) stated his junior college livestock judging coach was effective because he "let us judge, critique how we did it, and explain the mistakes we made."

When asked if they perceived themselves as effective during their first year in the teaching profession, all the participants responded in the affirmative. Participants had various reasons for why they believed they were effective. One participant (#1) related that she had been effective because her enrollment had grown from 67 students, when she first arrived on the job, to 101 students who were pre-enrolled in her program for the following year. She further stated the reason for this growth was due in large part to her desire to increase her programs' visibility. Another participant (#3) explained he had been effective because he had convinced a few more kids to go to college and continue their education. Yet another participant (#5) iterated that being an effective teacher extended beyond one's own subject matter and classroom and that an effective teacher reaches out across various disciplines to ensure what is best for students. As such, he believed he was an effective teacher because of his ability to detect the overall worth and value of the entire school system and work with other teachers to assist students in the overall learning process. He stated,

> One thing I stress is the importance of being the best or doing their best. And if I ever have a student that comes through on that ineligible list, I take that student to that teacher in the class they are ineligible in and I ask, "What do we need to do?" So, that shows the student that I care, that shows the teacher that I care. It also shows the student they need to be on the ball, and they respect me and that other teacher when they start to do that.

While AC teachers recognized their areas of strength, they also were quick to point out concerns they encountered. One participant (#6) elaborated that he is his own worst critic, but that he had the luxury of working with a veteran teaching partner who provided mentorship whenever needed. He stated, "I would go in [to his veteran teaching partner] and say 'I just don't think I was a very good teacher today.' And he'd say, 'Well congratulations. You're normal.' You know, not every day can be perfect."

Two participants (#1, 2) stated they wished the pace of the school year would have been slower. The fast-paced nature of the school year, especially as it relates to teaching secondary agricultural education (i.e., FFA events, supervising student projects), prevents some teachers from being able to plan as appropriately as they would like for classroom and laboratory

instruction. One participant (#2) stated she wished she would have been more prepared to teach her classes.

> If I could change something, I would have been more prepared in my teaching. I would have had better lesson plans. But, I started three days before school started, so it's hard to prepare for that when you're not prepared in the beginning.

Two participants alluded to the fact that there is no substitution for experience. One participant (#6) described his first year of teaching to "walking in the dark without a flashlight" and that "sometimes you just have to get through and take good notes and realize for next year, I'm going to be ready for this." Another participant (#2) noted having experienced the first semester made her better at managing her time during the second semester. She stated, "I already feel like from first semester to second semester I was a better time manager."

Another participant (#1) recognized the need to document her experiences throughout the year for further planning. Fortunately, for her, she maintained good notes of what worked as it pertained to classroom and laboratory instruction and what was most effective throughout the year in terms of planning and organizing the entire agricultural education program. As such, she now has a "template" for which topic areas she should teach, and how best to teach them. She acknowledged she has worked hard to maintain notes throughout the year so she can be better prepared for the following year.

While participants believed they were effective, the researcher's field notes consisted of mixed results. Numerous times throughout the observations, the researcher detected students who were neither interested nor engaged in the learning environment. For instance, little variability existed as it related to using multimedia and visual aids. PowerPoint® presentations were the most frequently used multimedia source. It was observed that three of the six participants (#3, 5, 6) used PowerPoint®, while the remaining three participants employed the lecture method of instruction and either wrote the content on the chalk board (#1) or overhead transparency film sheet (#4), or read the content to the students out of a textbook (#2).

Discussion

Using context variables from the Dunkin and Biddle (1974) model as a theme, it was revealed that the reasons these first-year Oklahoma AC agriculture teachers entered the profession was twofold: 1) their desire to work with youth; and 2) the "opportunity" presented by the shortage of teachers across the country. The reasons these teachers decided against majoring in agricultural education/teacher preparation were mainly due to the costs associated with student teaching and the fact that they never initially wanted to teach, and/or their initial career plans changed once they entered the workforce. These findings align with studies conducted by Rocca and Washburn (2006) and Shen (1997), which found teaching is typically a second career choice for AC teachers. Further, Joerger and Boettcher (2000) stated ". . . teaching may be one of the most difficult of all professions to master" (p. 587). This statement was validated by the quote from participant #6 who stated teaching "can be like walking in the dark without a flashlight."

As for their former work experience, four of the six AC teachers interviewed in this study have a variety of previous work experience they bring to the classroom, which supports the findings

from a study by Ruhland and Bremer (2002). These teachers indicated their experience has been valuable to them as teachers. Their experiences have enabled them to work better with parents, gain expertise in a particular field of study as it relates to the agricultural education curriculum, and understand the importance of organization and programming. However, their experiences do not necessarily equate to effective classroom teaching related to the findings from Rosehnshine and Furst (1971). These teachers admitted to needing additional information on how to vary their teaching methods to be more student-centered.

To address process variables (Dunkin & Biddle), AC teachers were asked to qualify their thoughts on how their students learn best. These teachers perceive their students learn best through experiential education and hands-on instruction. However, when probed about their own teaching style, a presage variable, AC teachers responded they enjoy lecturing and using PowerPoint® presentations to teach students in their classrooms. As such, there appears to be a disconnect in how AC teachers believe students learn best and how they teach.

When asked to describe the product variable, effective teaching, some of the AC teachers reflected directly on a former teacher they experienced as a student in the past, which resulted in how they came to know and perceive quality teaching (Hofer & Pintrich, 1997; Korthagen & Kessels, 1999). Responses can be couched into three areas: controlling the physical environment of the classroom, presenting information clearly, and building relationships with students. Specifically, AC teachers stated that effective teachers should be individuals who are able to control, motivate, relate, engage, and care for students in the classroom. Additionally, AC teachers noted effective teachers should make learning fun and explain concepts clearly. These areas support the need for pedagogical and instructional skill acquisition according to studies by Lynch (1996) and Roberts and Dyer (2004). While these are admirable traits, it was not believed that these teachers were connecting with all the qualities they deem effective, especially as it relates to student engagement and motivation. In fact, the researcher observed many of these participants' students to be neither engaged nor motivated in the topics being discussed. Although all AC teachers believed they were effective teachers, none of their epistemological rational involved student performance or achievement.

AC teachers recognized areas in which they need improvement. Respondents indicated the year went by too quickly, and as such, they needed to be prepared better for the fast paced atmosphere associated with teaching secondary agricultural education. Further, it was revealed there was a need for understanding and applying procedures related to classroom management issues. These AC teachers wished they had been better at managing their time and planning and organizing their daily activities, especially as it related to the functions associated with classroom and laboratory instruction. This finding supports Davis et al. (2006) who found AC teachers are concerned with being able to manage their classroom, time, and discipline/behavior issues.

Implications

Although teaching may be a second career choice for some AC teachers (Rocca & Washburn, 2006), could it be that administrators are recruiting teachers who have pursued alternative routes over those who have achieved traditional certification? It seems plausible to think that depending on geographic location, AC teachers may be at an advantage in the hiring process. For instance, one teacher expressed that a school board member called him for six months before he finally relented to becoming the agriculture teacher at the school where he graduated. As such, administrators and school board members across the state may be somewhat leery of hiring teachers outside their school district for fear they will leave after a short while for a position closer to home. This could be especially true in rural areas of Oklahoma, where the populations continue to dwindle. Additionally, AC teachers who are employed in their hometown or neighboring town tend to understand the area already and have a vested interest in the community. Thus, they may be more apt to remain in those areas for longer periods of time as compared to others who are not from the area.

Recommendations for Practice

Professional development and credit courses should be offered in an attempt to provide AC teachers with appropriate pedagogical and methodological skills required to assist students' needs regarding hands-on classroom and laboratory instruction. Further, professional development workshops should be organized as a means to further assist first year AC teachers with the areas they perceive to need improvement. Specifically, workshops should focus on time management strategies and planning procedures as it relates to the entire agricultural education program. Further, intensive, sustained, and prolonged professional development workshops should focus on various areas related directly to classroom and laboratory instruction (i.e., planning lessons and units of study; locating, securing, and sequencing curriculum and resources; managing the classroom; and handling misbehavior of unruly students).

Additionally, efforts should be made to increase scholarship funds for student teacher experiences in an effort to retain preservice students in the pipeline. Lastly, future studies should assess teacher reflection practices, through journaling, to better understand the trials and tribulations AC teachers experience day-to-day in "real time." This would allow interventions for support, feedback, and assistance in an effort to empower the AC teacher to be more effective and credible.

Recommendations for Future Research

Perhaps 60 hours of observation is insufficient to make large conclusions on teaching effectiveness. Because the RT program is comprised of three committee members who make observations throughout the year, it is recommended that further studies consider the principals' and mentors' assessments of AC teachers. Specifically, these two individuals interact with the AC teacher on a daily basis. Therefore, their direct and indirect observations of the AC teacher should be taken into account.

Further, does a teacher's route to certification really matter (Good et al., 2006)? It is important to know which criteria principals use when hiring agricultural education teachers. Future studies should assess the factors affecting the employability of teacher candidates.

In this study, context variables (Duncan & Biddle, 1974) were self-reported by the RT based on their perceived ability to impact student achievement positively. Further research should be conducted to determine the effect AC teachers have on students' standardized test scores and agricultural competency knowledge as compared to traditionally certified RTs.

Although this study emphasized teaching only, Roberts and Dyer (2004) opined that being an effective agriculture teacher is more than just teaching in a classroom. As such, other "duties" of an agricultural education instructor should be explored. To that end, what are the mental images and epistemologies of first-year Oklahoma AC agriculture teachers as it relates to FFA and SAE? Do the variables associated with the Dunkin and Biddle (1974) model affect how teachers advise students in the FFA or supervise SAEs? Additional research should assess this question as a means for understanding the perceived trials and tribulations first-year AC teachers experience as it relates to their responsibilities as an FFA advisor and supervisor of student projects. Further, while this study focused on the qualitative responses of AC teachers concerning effective teaching, broadly speaking, what are the levels of efficacy of AC teachers as it relates to the courses they teach? Do AC teachers have an understanding of all courses they are expected to teach? What are their areas of strength and weakness? What is their overall level of teacher self-efficacy as it relates to classroom and laboratory instruction? Lastly, this group of AC teachers should be followed and interviewed again at the end of their second year to determine if another year's worth of experience aided them in becoming more effective at performing their jobs as teachers and to understand if their mental models and epistemologies of classroom and laboratory instruction changed over time.

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PERCEIVED JOB RELATED STRESSORS OF NEW AND BEGINNING AGRISCIENCE TEACHERS IN GEORGIA

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Abstract

The average teacher in this study was a white female, 25-34 years old, married, and living in a rural area. The average participant had a bachelor's degree from an agriculture education program and had been teaching for two years with no teaching experience prior to their current employment. Participants in this study felt that time constraints, overburdened workloads, and demands on class load/time caused the highest amounts of stress. In general, participants indicated that the construct of administrative support was most stressful. They also indicated that while support was available from university faculty, state department of education staff, and local school districts, participants experienced the most interaction with state department of education staff. It should also be noted that only 31% of the respondents indicated that their school districts had a mentor program to assist new teachers with acclimating to the school district and job expectations. Conclusions of this study support in-service opportunities to become more proficient with FFA related applications and also workshops relative to time management skills and communicating with administrators. By identifying, preparing, and potentially alleviating stressors, first year and beginning teachers will not feel as stressed, and burn out will be less likely to occur.

Introduction

Teachers are the foundation of a successful agricultural education program. Behind the closed doors of the classroom, it is the teacher who stimulates new ideas and concepts and encourages students to look beyond the ordinary into the extraordinary. Instead of being viewed as the preparation for a more productive adulthood, education is now seen as a lifelong necessity for personal and social well-being (Rachal, 1989). In today's growing demand of meeting benchmarks and deadlines, teachers are now faced with the challenge of not only providing an adequate learning environment for their students, but to prepare students for more productive lives in our fast-paced world (Layfield & Dobbins, 2002). For a new teacher entering the agricultural education setting, demands and expectations can seem overwhelming and stressful.

Stress has many definitions. For the purpose of this study, Seyle's (1974) definition of stress is most appropriate - stress is the "nonspecific response of the body to any demand made upon it to adapt, whether that demand produces pain or pleasure" (p. 692). Further, to truly understand stress from such a basic definition, one must understand the psychological basis in which stress occurs in our daily lives. Stress can be triggered by a cadre of events: death of a spouse, personal injury, health issues, change in financial state, change in residence, and change in responsibilities at work (Denhardt, Denhardt, & Aristiquets, 2009). Symptoms of stress can be as basic as sweaty palms, loss of appetite, and tense muscles, to as severe as deteriorating health, lack of productivity in the workplace, and depression (Reglin & Reitzammer, 1998). Teachers who are vulnerable to high levels of stress are more likely to suffer from fatigue, burnout, and leave the teaching profession.

To aid in the prevention of high levels of stress and teacher burnout, several researchers have focused on the in-service needs of beginning agriscience teachers identifying competencies in need of more training (Garton & Chung, 1996; Edwards & Briers, 1999; Layfield & Dobbins, 2002; Joerger, 2002; and Duncan, Ricketts, Peake, & Uesseler, 2005). Among the most commonly mentioned competencies that need to be included in in-service programs were completing reports for local and state administrators, motivating students to learn, preparing FFA degree applications, developing effective public relations programs, preparing proficiency award applications, developing SAE opportunities for students, developing local adult education programs, developing performance based assessment instruments, utilizing a local advisory board, and organizing fund-raising activities for the local FFA chapter.

On the other hand, several studies have focused on tasks and factors which prove to be difficult and/or problematic for new teachers (Greenan, Wu, Mustapha & Ncube, 1998; Henderson & Nieto, 1991; Burke & Hillison, 1991; Fritz & Moody, 1997; Trexler & Hikawa, 2001; Walker, Garton, & Kitchel, 2004; and Myers, Dyer, & Washburn, 2005). These tasks and factors are referred to as stressors. They include but are not limited to lack of student interest, lack of administrative support, poor discipline/student management, time demands, lack of instructional equipment/supplies, lack of resources and curriculum, inadequate class length, lack of support from curriculum coordinator, lack of in-service education, curriculum development and lesson planning, managing paperwork and finances, working with parents, teachers, and administrators, recruitment of students and alumni, working with special needs students,

organizing an effective advisory committee, organizing an effective alumni chapter, and the establishment and management of support groups.

The time constraints of developing additional curriculum, insufficient school administration support, the lack of model curriculum or outline and the lack of support for selecting benchmarks and standards were found to be the most unhelpful to the six first year teachers in a study conducted by Trexler and Hikawa (2001). All teachers indicated that they needed more time and more support from the curriculum coordinator for the programs to be more successful. Specifically, support with identifying benchmarks, developing curriculum scope and sequence, help with searching for resources and preparing activities and in-service training were identified as actions that could most improve the curriculum for the future.

Henderson and Nieto (1991) conducted a study evaluating the morale levels of first year agriscience teachers in Ohio. Inadequate school facilities, a heavy teaching load, getting along with other teachers or principals, community pressures, teacher salary, and community support were possible sources of frustration (Henderson and Nieto, 1991). The most common frustrations expressed by agriscience teachers in a study conducted by Burke and Hillison (1991) were the lack of student interest, the lack of administrative support, poor discipline and student management, time demands, and lack of instructional supplies. Garton and Chung (1996) sited completing reports for local and state administrators, motivating students, preparing FFA degree applications, developing public relations programs and preparing proficiency award applications as the in-service needs of the first year agriscience teachers.

Conceptual Framework

Predicting and preventing employee burnout is an essential component of organizational survival. Research by Maslow and Herzberg more than 50 years ago suggest that satisfied and stress free employees tend to be more productive, creative, and committed to their employers' (Alshallah, 2004). Unfortunately, to be truly stress free in an organization is an impossibility (Moorhead, 2007).

Quick and Quick (1984) developed a model of organizational stressors and the consequences of the stressors on the individual and the organization. Quick and Quick identified four types of organizational stressors: task demands, physical demands, role demands, and interpersonal demands. Task demands are stressors specifically associated with the job a person performs. These include occupation typology, job security, and overload (having more work assigned than the person is capable of completing). Physical demand stressors include the physical requirements of the job including temperature of working conditions, strenuous labor, office design and space, and work hours. Role demand stressors are identified as the set of expected behaviors, written or insinuated, associated with the position including role ambiguity, role conflict, and role overload (expectations for success exceed the capability of the individual). Group pressures, leadership style of the manager/superior, and personality conflicts are identified by Quick and Quick as interpersonal demands and potential stressors. Individual stressors or life stressors are categorized as life change and life trauma.

Quick and Quick (1984) conclude that each type of stressor has unique consequences. These consequences can impact the individual as well as the organization. Behavioral, psychological, and medical are individual consequences of both organizational and life stressors. Organizational consequences including burnout and organizational mortality as well as organizational decline are detriments caused by organizational and life stressors.

Purpose and Research Objectives

The purpose of this study was to determine what the most common stressors new and beginning agricultural education teachers are faced with. It is the researchers' intent to identify the main sources of strain and stress and provide suggestions on how these stressors can be limited. Upon the identification of these stressors, recommendations can be provided to guide teachers, administrators, and support staff in making decisions that can potentially alleviate the stress new and beginning teachers feel. The following objectives guided this study:

1. Describe new and beginning teachers using selected demographics;
2. Identify the common stressors new and beginning agricultural education teachers face in the classroom;
3. Determine which construct of stressors has the greatest impact on new and beginning agricultural education teachers; and
4. Discover what current support is offered to new and beginning teachers

Procedures

This study was a descriptive study of early career agriscience teachers in Georgia, defined as those in their first to fifth year of teaching. A list of all the new and beginning agricultural education teachers in Georgia was obtained from the Georgia department of education staff. There were approximately 142 agriscience teachers who fit the criteria for this study (Georgia Agriculture Education, n.d.). In order to reach a large number of potential participants, a convenience sample of beginning teachers in attendance at the 2009 Georgia Vocational Agriculture Teachers Association Summer Conference was selected to be given the questionnaire. A total of 77 questionnaires were collected which accounted for 54% of the total population being studied. As this was a one shot approach to colleting data, no attempt was made to address non-response.

An instrument, developed by a panel of experts consisting of university faculty and Georgia Department of Education staff, compiled 34 stressors into six constructs. Participants were asked to indicate the level of stress for each stressor using a 5-point Likert-type scale with 1 being least stressful and 5 being most stressful. The instrument also asked for selected demographic data and information on support available from local school districts, state staff, and university faculty. As previously stated, paper copies were distributed to participants during the 2009 Georgia Vocational Agriculture Teachers' Association Summer Conference and collected upon completion. Data were coded and analyzed using SPSS 14.0 software. Frequencies, means and standard deviations were calculated and reported as appropriate.

Results

Objective one sought to determine specific demographic characteristics of Georgia agriscience teachers with one to five years of teaching experience. The average teacher in this study was a white female, 25-34 years old, married, and living in a rural area. The average participant had a bachelor's degree from an agriculture education program and had been teaching for two years with no teaching experience prior to their current employment. A breakdown of demographic statistics can be found in Table 1.

Table 1
Teacher Demographics

Characteristic	*F*	%
Gender		
Male	37	49
Female	39	51
Ethnicity		
Caucasian	75	98.7
African-American	1	1.3
Age		
<25	19	24.7
25-34	46	59.7
35-44	7	9.1
45-54	4	5.2
55+	1	1.3
Level of Education		
Bachelor's	45	58.4
Master's	25	32.5
Specialist	6	7.8
Doctorate	1	1.3
Marital Status		
Married	51	66.2
Unmarried	26	33.8
Size of Community		
Rural	48	62.3
Suburban	24	31.2
Urban	5	6.5
Years Teaching Agriculture		
1	16	20.8
2	23	29.9
3	14	18.2
4	14	18.2
5	10	13
Previous teaching Experience		
No	67	87
Yes	10	13

Research objective two sought to identify the most common stressors new and beginning agricultural education teachers face in the classroom. The stressors were categorized into six constructs (FFA Responsibilities, Time Constraints, Financial Constraints, Student Interactions, Curriculum Development, and Administrative Support). The stressors are ranked from most important to least important as identified by mean scores (Table 2). Preparing FFA proficiency applications (M = 3.32) and organizing FFA fundraisers (M = 3.23) were the top two stressors for the FFA Responsibilities construct. Time constraints (M = 3.74) and over burdened workloads (M = 3.53) were the top two stressors for the Time Constraints construct. Small operating budgets (M = 2.56) was the top Financial Constraint construct and creating curriculum from scratch (M = 3.18) was the top stressor for the Curriculum Development construct. For the final construct (Administrative Support), lack of administrative support (M = 3.14) and developing relations with administrators (M = 3.14) were the top two stressors.

Table 2
Stressors Listed by Construct

Stressor	M	SD
FFA Responsibilities		
Preparing FFA proficiency applications	3.32	1.46
Organizing fundraisers	3.23	1.16
FFA responsibilities	3.11	1.29
Planning FFA banquets	3.01	1.23
Developing SAE opportunities for students	2.87	1.08
Supervising SAE projects	2.71	0.97
Organizing student internships	2.35	1.16
Time Constraints		
Time Constraints	3.74	1
Over burdened work loads	3.53	1.13
Demands on class load/time	3.44	1.02
Excessive paperwork	3.39	1.1
Class scheduling	2.72	1.13
Inadequate class length	2.17	1.12
Teacher meetings/conferences	1.81	0.97
Financial Constraints		
Small operating budget	2.56	1.23
Lack of proper teaching materials	2.36	1.17
Inadequate school facilities	2.30	1.15
Student Interactions		
Student discipline	3.08	1.25

Student recruitment	2.83	1.26
Lack of student interest	2.81	1.2
Teaching learning disabled students	2.79	1.2
Curriculum Development		
Creating curriculum from scratch	3.18	1.33
Teaching new content	3.11	1.1
Inexperience/unfamiliarity w/ course content	2.92	1.33
Spending time on curriculum development	2.81	1.16
Organizing and supervising teaching laboratories	2.75	1.17
Completing GPS requirements	2.68	1.21
Developing performance based assessment instruments	2.63	0.99
Graduation requirements	2.08	1.13
State funding applications	2.08	1.06
Administrative Support		
Lack of administrative support	3.24	1.92
Developing relations with administrators	3.14	3.32
Lack of support from guidance	3.08	2.52
Inability to collaborate w/ other teachers	3.01	1.54

Note. 5-point scale (1= least stress, 5= most stress)

Research objective three sought to determine which construct of stressors has the greatest impact on new and beginning agricultural education teachers. As evidenced in Table 3, the Administrative Support construct (M = 3.14) was the top ranked construct followed by Time Constraints (M = 2.94) and FFA Responsibilities (M = 2.94) rounding out the top three.

Table 3
Constructs in Order of Amount of Stress

Construct	*M*	*SD*
Administrative Support	3.12	.10
Time Constraints	2.97	.75
FFA Responsibilities	2.94	.33
Student Interactions	2.88	.14
Curriculum Development	2.69	.39
Financial Constraints	2.41	.14

Note. 5-point scale (1= least stress, 5= most stress)

Objective four was to determine what support is available for new and beginning teachers. This study looked at potential support offered by university faculty, state department of education staff, and local school districts. Sixty-seven percent of participants had been prepared to teach through a traditional undergraduate teacher preparation program. The teacher education programs were rated as good or excellent by over 72% of participants. Eleven respondents

(14.3%) indicated that they had been visited by university faculty during the previous school year with 90% of those being visited 1-4 times throughout the school year.

When asked if they had attended a new teacher orientation put on by state department of education staff, 88% indicated that they had. Of all the participants, 74% had been visited at least once by state staff, with over 34% having been visited three or more times the previous school year.

The final source of support studied was the local school district for each participant. Respondents indicated that less than eight percent had attended a new teacher orientation held by their school district. Just over 31% of respondents indicated that their school districts had a mentor program to assist new teachers with acclimating to the school district and job expectations. Table 4 shares the number and percent of responses for each question regarding sources of support for new and beginning teachers.

Table 4

Sources of Support from University Faculty, DOE Staff, and School Administrators

Support Available for New and Beginning Teachers	*f*	%
Support from University		
Were you prepared in a traditional undergraduate teacher education program?		
Yes	52	67
No	25	33
If so, rate the quality of the teacher education program		
Poor	2	2.7
Acceptable	18	24.3
Good	39	52.7
Excellent	5	20.3
Have you been visited by a university teacher educator?		
Yes	11	14.3
No	66	85.7
If yes, how many times?		
1-2	5	45.5
3-4	5	45.4
5+	1	9.1
Support from Department of Education State Staff		
Did you attend a new teacher orientation with state staff?		
Yes	68	88.3
No	9	11.7
How many times have you been visited by state staff this year?		
0	20	26
1-2	32	41.6
3-4	17	22.1
5-6	7	9.1
7+	1	1.3

Support from Local School District		
Did you attend a new teacher orientation at your school?		
Yes	6	7.8
No	71	92.2
Does your school have a mentor teacher program for beginning teachers?		
Yes	24	31.2
No	53	68.8

Conclusions/Recommendations/Implications

The average participant in this study was a white female; however it is of note that gender was split almost in half. Over 84% of respondents were less than 35 years old and most held bachelor's degrees from traditional agriculture education programs. Of those participating in this study, over 40% held advanced degrees. Further research should be conducted to determine what area of study new and beginning teachers choose for their continued education and if having additional training impacts their level of stress or which situations cause them stress. Another avenue of study should compare levels of stress by years of teaching experience to determine if there is a shift in priority or focus at a common point during a teaching career.

The findings of objective two supported those reported by Burke and Hillison (1991). The top four stressors were time related. Those being 1) Time constraints, 2) Over burdened work loads, 3) Demands on class load/time, and 4) Excessive paperwork. The fifth ranked stressor was 5) Preparing FFA proficiency applications, an FFA responsibility, which was similar to the findings of Garton and Chung (1996) who stated that completing reports and FFA applications were among the top in-service needs of agriscience teachers.

Burke and Hillison (1991) included lack of administrative support as one of the most common frustrations of agriscience teachers. Objective three of this study concluded that administrative support was the construct of highest overall stress for new and beginning teachers. These findings support the practice of providing in-service opportunities for teachers to become more proficient with reports such as FFA proficiency and degree applications, and other FFA related administrative paperwork. While that will address the specific stressors of excessive paperwork and preparing FFA proficiency applications, more general in-service opportunities should also be developed to assist teachers in developing time management strategies and also learning how to effectively communicate with school administrators. Further research should be conducted to determine what can impact the relationship between an agriscience teacher and an administrator, how teachers go about developing relationships with administrators and perceptions held by both agriscience teachers and administrators about what and how information should be communicated between the two.

The findings of objective three ranked the six defined stressor constructs in order of greatest impact on beginning agriscience educators. The ranking from highest to lowest construct was found to be: administrative support, time constraints, FFA responsibilities, student interactions, curriculum development, and financial constraints. Comparing these results with

the Quick and Quick (1984) model of stressors, the researchers found administrative support is categorized as interpersonal stress, time constraints are categorized as task demand related stress, FFA responsibilities are categorized as task demand related stress, student interaction is categorized as interpersonal stress, curriculum development is categorized as role ambiguity stress, and financial constraints are categorized as physical demands. It can then be concluded interpersonal stressors and task stressors are the most common and are classified as having the greatest impact on stress in new and beginning agriscience teachers.

Quick and Quick (1984) as well as Moorhead (2007) note the consequences of these two types of stress include both individual and organizational ramifications. Educators with high identified stresses in interpersonal and task demands are more likely to incur individual consequences of sleep disturbances, depression, heart disease, headaches, and anxiety. Organizationally, these stressors result in a decline in personal job performance, absenteeism and turnover, decreased motivation and satisfaction, and burnout. These two stressors are detrimental to not only the individual, but also the school district, state and national FFA, and agricultural education programs.

Preparing new and beginning agriscience teachers for the stresses associated with interpersonal interactions and task demands is essential in lowering the perceived stress of the new teacher. Institutional programs for managing organizational stressors can and should occur before the teacher begins teaching (university level) and after the teacher begins (state and school level). These programs include work design and preparation, work schedules, organizational culture, leadership, and interpersonal learning sessions (Frey, Quick, & Nelson, 2007).

Objective four looked at the sources of support for new and beginning teachers and found that the greatest level of interaction for new teachers came from state department of education staff. The majority of participants attended an orientation session with state staff and had also been visited personally at least once by state DOE personnel. This being the case, research should be conducted to determine how to best capitalize on those interactions to fulfill the needs of new and beginning teachers. It is also important to determine if more support is available from university faculty and school districts that is not being taken advantage of by new teachers or if there is a need for additional support from these sources.

If young teachers are to be successful and continue a long-term career in the classroom, it is imperative agricultural education preparatory programs and state department of education staff conduct in-service programming that truly prepares teachers for the cadre of challenges they face in and out of the classroom. There is a need to inform new and beginning teachers of the strains and stressors teachers face during their first years in the classroom. The results of this study will help those preparing young agricultural educators for the organizational and life stressors that accompany teaching. By identifying, preparing, and potentially alleviating these stressors, first year and beginning teachers will not feel as stressed, and burn out will be less likely to occur. This will lead to less teacher turnover and strengthening of agricultural education programs.

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SECONDARY AGRICULTURAL EDUCATION TEACHERS IN NORTH CAROLINA: FORECASTING UNDERLYING WORK-RELATED JOB-STRESS LEVELS

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Abstract

This study sought to explain and predict job stress levels among secondary agriculture teachers. The sample consisted of agriculture teachers (n = 201) in North Carolina. Data were collected using the Job Stress Survey. From the findings of the study it was concluded that the average teacher was married, male, and had over 13 years of experience. The majority of teachers reported working between 46-65 hours per week. The majority of these teachers also worked in a one or two teacher agriculture program. Overall agriculture teachers were not in a state of stress, however 48% of them were in the stressed category. Additionally, four percent of the variance in agriculture teachers' Job Stress Index score can be predicted by the teacher's sex, with females being more stressed.

Introduction and Theoretical Framework

Stress has become such a relatively normal part of the vocabulary that it's hard to believe the term stress was coined by Hans Selye a little over 50 years ago (Selye, 1973). Selye, largely considered the father of stress research defined stress as "the nonspecific response of the body to any demand made upon it" (p. 692). More recently, Humphrey and Humphrey (1986) defined stress as "any factor acting internally or externally that makes it difficult to adapt and that demands increased effort from the person to maintain a state of equilibrium within himself and his external environment" (p. 2-3). Stress can be the excitement, challenge, inspiration to do well and perform at high levels, yet at the same time stress can make an individual fearful, angry, frustrated and unable to relax (Cosgrove, 2000). According to the American Psychological Association (2007), one-third of people in the U.S. regularly reported experiencing extreme levels of stress. Extreme levels of stress can make it difficult for individuals to operate in normal day to day activities (Humphrey & Humphrey).

These concerns, coupled with the pressures and responsibilities of the job have the potential to cause an excess of job stress. Concern with the affects of job stress on a person's productivity, absenteeism, and health-related problems have increased dramatically during the last decade (Vagg & Spielberger, 1998) resulting in employee dissatisfaction, lowered productivity, absenteeism, turnover, and burnout (Cummins, 1990; Spielberger & Reheiser, 1995). Furthermore, the presence of certain situational factors or personal characteristics such as personality, social support including marital status, and physical exercise can protect individuals from illnesses that may be caused by stress (Manning & Fusilier, 1999).

Teachers are not exempt from the concern surrounding job stress and burnout. According to Adams (1999), high levels of stress can be harmful to teachers and may negatively affect their teaching, personal lives and, most importantly, their students. While most teachers agree that teaching is rewarding, it is also considered a difficult career because of too few resources, too much paperwork, crowded classrooms, students with emotional problems, low salary and high-stakes standardized testing (Strauss, 2002). Humphrey and Humphrey (1986) estimated that teachers make more than 400 decisions a day. This is particularly true in agricultural education as teachers face the challenge of meeting both traditional teacher roles as well as additional specific programmatic roles associated with teaching secondary agricultural education (Torres, Ulmer, & Aschenbrener, 2007).

Job stress research relative to secondary agriculture teachers has implications for improving the nature of the job and providing insight into possible interventions. The most influential framework for conducting research on job stress has been person-environment (PE) fit theory (Brewer & McMahan, 2004; Edwards & Cooper, 1990; Spielberger & Vagg, 1999). The PE fit theory is proposed as an approach for understanding the process of adjustment between individuals and their work environment (Caplan, 1987). According to the theory, stress results from the demands of the job that the person may not be able to meet, insufficient supplies, or strain in the workplace and the person's individual needs as observed by the interaction of the individual with his or her work environment (Landsbergis, 1988; Vagg & Spielberger, 1998). The interaction between an individual and his or her environment determines whether or not a

situation is stressful for that person (Brewer & McMahan). When demands of the job exceed a person's ability to meet those demands, the fit between an individual and their environment is incompatible; leading to a condition of stress. Those who are experiencing high amounts of stress need to be aware of the possibility of burnout. Freudenberger (1974) defines burnout as the extinction of motivation or incentive, where one's devotion to a cause or relationship fails to produce the desired result.

PE fit theory identifies of two basic measures regarding a person and the environment. The first measurement is objective, and the second is subjective. The objective environment indicates physical and social situations and events as they exist, independent of the person's perceptions, whereas the subjective environment refers to situations and events as perceived by the person (Edwards & Rothbard, 1999). This study focuses on the subjective measures of PE fit. Within this study, subjective PE fit measures become a concern of job stress due to the perceived misfit between perceptions and values.

According to Olpin and Hesson (2007), stress can be dichotomized into good and bad stress, where bad stress may lead to physical and mental exhaustion, illness and ultimately breakdown or a complete state of job burnout. In contrast, good stress is characterized by healthy tension that is associated with performance; as stress levels increase, so does performance. This concept is best described as the Yerkes-Dodson Principle (Olpin & Hesson, 2007) which suggests that to a certain point, a specific amount of stress is healthy, useful, and even beneficial. However, the Yerkes-Dodson Principle also suggests that the relationship between increased stress and increased performance does not continue indefinitely, rather at some point, stress becomes fatigue and crosses over to bad stress or said differently, a state of distress.

Review of Literature

Stressors resulting from job responsibilities include factors such as work conditions, technological advancements, work responsibilities, underutilization, lack of autonomy, role conflict, lack of support from supervisors and colleagues, organizational climate and transferable job skills (Cooper & Payne, 1988).

Teacher stress literature is a subset of a much larger effort to investigate the affects of job stress in a variety of occupations and settings (Guglielmi & Tatrow, 1998). However, stress in education is not a new concern. Humphrey and Humphrey (1986) reported that teachers averaged four and a half days of absences each year with a third of those absences being related to stress. In addition, it was reported that 35 percent of teachers indicated calling in sick due to fatigue and 84 percent believed that there were health hazards in teaching. Furthermore, 80 percent said their view of teaching had changed since beginning in the profession, and 23 percent admitted having a poor ability to cope with stress (Humphrey & Humphrey).

Many studies have attempted to identify the sources of stress in elementary and secondary school teachers (Borg & Riding, 1991; Farber, 1984; Friedman, 1991; Guglielmi & Tatrow, 1998; Kyriacou & Sutcliffe, 1978; Mazur & Lynch, 1989; Milstein, Golaszewski, & Duquette, 1984; Mykletun, 1984; Olson & Matuskey, 1982). According to Cosgrove (2000), factors leading to teacher stress were students who are poorly prepared, student indiscipline, poor

working conditions, time pressures, low job status, and conflicts with colleagues. Other factors leading to teacher stress included role overload, poor learner behavior, lack of resources, class size, diversity in individuals with whom they have to work, and lack of motivation of co-workers (Smylie, 1999).

The end result of teacher stress has been that many talented men and women with high expectations of achievement become dispirited and disillusioned. Some have left the teaching profession; others have stayed, but have been plagued by a multitude of physical, emotional and behavioral stress-related manifestations (Milstein & Golaszewski, 1985). This has been particularly true for new teachers. Roulston, Legette, and Womack (2005) confirmed that about 33 percent of new teachers quit the teaching profession within the first three years of their career. Having the ability to deal with stress is vital in teacher retention. According to Croom (2003), agriculture teachers experienced moderate levels of emotional exhaustion in their work. However, there is hope for stressed teachers. Research (Cohen & Willis, 1985; Shumaker & Czajkowski, 1994) showed social support reduces the impact of stressors on a variety of outcomes, including psychological well-being, job satisfaction, and risk of physical illness.

The demands of the job coupled with the range of responsibilities of operating, managing and teaching in an agricultural education department may well create stress in teachers. Agriculture teachers draw upon physical, emotional and intellectual resources in order to be effective in the classroom (Cano, 1990). The phenomenon of increasing job responsibilities in agricultural education has been well documented in the literature (Delnero & Montgomery, 2001). One early observation cited by the National Research Council (1988) was secondary agriculture teachers spend a great deal of time helping students excel in production-oriented FFA competitive events and award programs and less time on classroom instruction. In recent years, more, not less has been added to the job responsibilities in agricultural education. Adding to the pressure of frequent decision making, secondary agriculture teachers work well beyond a 40-hour work week preparing lessons, evaluating student work, coaching career development teams, and supervising student projects (Croom, 2003; Straquadine, 1990; Torres et al.). Little problems do add up; taking more of a toll on the health and well-being on individuals (London & Spielberger, 1983) and contributing to stress and burnout. Based on one estimate, 54 percent of all worker absences are in some way stress related, and cost U.S. industries over $150 million per year (Elkin & Rosch, 1990; Karasek & Theorell, 1990). Researching the source of job stress relative to agriculture teachers has implications for improving the nature of the job and may provide insight into possible interventions in cases where stress exists.

Purpose and Research Objectives

The purpose of the study was to explain and predict job stress among secondary agriculture teachers from selected characteristics. The following research objectives were addressed in the study:

1. Describe selected characteristics of secondary agriculture teachers (sex, marital status, and hours per week at work, personality type, and number of teachers in department, days a week of exercise, sources of social support, number of years teaching, number of children, and number of years at current school).

2. Describe the level of job stress among secondary agriculture teachers.
3. Determine the number of teachers who have reached the stress threshold.
4. Predict job stress from selected characteristics of secondary agriculture teachers.

Procedures

The design for this study was descriptive-correlational research. The accessible population was secondary agriculture teachers in North Carolina (N = 415) during the 2007-2008 academic year. The frame was obtained from the North Carolina Agricultural Education Office. Deliberate efforts were made to remove duplicate names and ensure an accurate frame was obtained. A simple random sample was use to select subjects for the study. According to Krejcie and Morgan (1970), the desirable sample size was n = 201 to obtain a known precision (+/- 5%) and confidence level (95%).

Instrumentation

Data were collected using the Job Stress Survey (JSS) developed by Spielberger and Vagg (1999). The JSS was a standardized and commercially available instrument designed to measure job stress as a function of job-related items perceived to be a source of severe and frequent stress. The JSS contained two sections. Section one sought to determine teachers' perceived level of severity for 30 common job-related stressors using a scale from 1-9; nine being the most stressful measure.

The second section sought to determine the frequency to which teachers encountered the job-related stressor at work during the previous six months using a scale that ranged from zero to more than nine occurrences in the last six months (0 – 9+). The two responses (severity and frequency) were used to produce three stress index scores: Job Stress Index (JS-X), Lack of Support Index (LS-X), and Job Pressure Index (JP-X). Index scores were calculated by multiplying severity scores by frequency scores. A third section was added to the questionnaire which sought teachers' personal, home and work-related information. Both a paper-pencil and electronic version of the JSS were prepared for use with participants.

Spielberger and Vagg (1999) reported the validity and reliability of the JSS through the results of previous studies. The creation of the instrument was detailed in the *Job stress survey: Professional Manual.* The manual further reported that the job-related items in the JSS were analyzed for construct validity using factor analysis. An alpha coefficient of .87 was reported for the Job Stress Index while the Lack of Support Index and the Job Pressure Index both had an alpha of .80 (Spielberger & Vagg).

Data Collection

Data were collected during the months of May and June of 2008. This period of time can be characterized as representing a high level of activity to include FFA Career Development Event activities as well as typical spring academic semester, instructional activities, and events. For many, this was also the end of the school year and researchers were striving to collect data before teachers began summer activities. Three points of contact were utilized when collecting

data. The data collection process began by mailing teachers a personally signed 3"x5" pre-notice postcard announcing the intent of the study and the forth coming request for participation. Two days later a personalized paper questionnaire was mailed to teachers. An email reminder was sent to teachers who had not responded by the specified date approximately seven days later. Using the HostedSurvey.com service, teachers were sent an email which included a personalized URL hyperlink to the online questionnaire. The opening page of the online questionnaire contained a message to teachers detailing the importance of the study and their participation as well as instructions for completing the online questionnaire. As a result, a response rate of 54% (n = 108) was achieved.

Teachers who responded by completing the questionnaire were assumed to represent response bias. Miller and Smith (1983) suggested procedures for examining response bias by comparing a sampling (10% to 30%) of non-respondent data to respondent data. Toward that end, a random sample representing 30% (n = 29) of the non-respondents was taken.

Non-respondents were mailed an envelope packet containing a revised and signed cover letter, a paper copy of the questionnaire, and a self-addressed, stamped return envelope as a reminder to participate in the study. The final contact with non-respondents consisted of a personalized email with a personalized link to the online questionnaire; followed by phone calls to all non-respondents. These efforts yielded a 34% (n =10) response rate, acknowledging some remaining potential for response error.

Data from teacher respondents (n = 108) and non-respondents (n = 10) were statistically compared on the primary variable of interest (JS-X). Using an independent samples t-test, no significant ($p < .05$) differences were found between respondent and non-respondent data on the variable of interest. Thus, non-respondent data were pooled with the respondent data, yielding a total response rate of 118 (59%).

All returned and/or submitted questionnaires yielded usable data. Data were coded by the researchers and analyzed using SPSS (v.15). Frequencies, percentages, and measures of central tendencies and variability were used to summarize the data. Stepwise multiple regression was also used in analyzing the data. According to Cohen and Cohen (1983), stepwise multiple regression should be used when the goal of the researcher is explanatory and/or predictive in nature; while Lewis-Beck, Bryman, and Liao (2004) suggested that stepwise multiple regression was appropriate when there was inadequate theory or subject knowledge to indicate the priority of one independent variable over another. The minimum number of cases required when using stepwise regression ($n \geq 40m$, where m is the number of predictor variables) was guided by Tabachnick and Fidell (2001). Further, the variance inflation factor (VIF) statistic was used to quantify the severity of multicollinearity. According to O'Brien (2007), some researchers use a VIF value of 5 and others use a VIF value of 10 as a critical threshold reflecting the presence of multicollinearity. For this study, the researchers used a value of 5 as the critical threshold. Cohen (1988) was used to calculate effect size. Interpretation of effect size was done using Thalheimer and Cook's (2003) descriptors for describing the relative size of Cohen's d. An alpha level of .05 was set *a priori*.

Results

Research question one sought to describe selected characteristics of secondary agriculture teachers and the schools where they taught. Table 1 displays the data. There were 73 male teachers (64.60%) and 40 female teachers (35.40%). The majority (*f* = 79, 71%) of secondary agriculture teachers reported working between 46 to 65 hours a week. More than half of the teachers (59.46%) described themselves as extroverts. Eighty percent of the teachers were employed in a one or two teacher department (*f* = 91, 80.53%). All (*f* = 112, 100%) teachers indicated receiving social support from friends and/or family with less than half indicating social support from membership in professional associations (*f* = 52, 46.43%) and just over half receiving support from community organizations (*f* = 67, 59.82%). Agriculture teachers had an average of 13 (*M* = 12.95, *SD* = 9.99) years teaching experience with over 9 (*SD* = 8.56) of those years at their current school. They also had an average of 1.32 (*SD* = 1.23) children with most respondents indicating marital status as married (*f* = 90, 79.65%).

Table 1

Characteristics of North Carolina Secondary Agriculture Teachers (*n* = 118)

Characteristic	*f*	%	*M*	*SD*	Range
Sex					
Male	73	64.60			
Female	40	35.40			
Hours a Week at Work					
36-45 hours	13	11.71			
46-55 hours	51	45.95			
56-65 hours	28	25.23			
66-75 hours	15	13.51			
75+ hours	4	3.60			
Marital Status					
Married	90	79.65			
Unmarried	23	20.35			
Personality Type					
Extrovert	66	59.46			
Introvert	45	40.54			
Number of Teachers/Department			1.84	0.86	1-5
1	45	39.82			
2	46	40.71			
2.5	1	0.88			
3	17	15.04			
4	2	1.77			
4.5	1	0.88			
5	1	0.88			
Source of Social Support					
Friends and Families					
No	0	0.00			
Yes	112	100.00			
Professional Associations					
No	60	53.57			
Yes	52	46.43			
Community Organizations					
No	45	40.18			
Yes	67	59.82			
Number of Years Teaching			12.95	9.99	1-36
Number of Children			1.32	1.23	0-5
Number of Years at Current School			9.34	8.56	1-34
Days a Week of Exercise			2.40	1.93	0-7

Note. Frequency totals represent missing data; valid percents are reported

Research objective two sought to compare the level of job stress of secondary agriculture teachers as measured by overall Job Stress, Job Pressure, and Lack of Support to normative data. The job stress results in Table 2 reveal that agriculture teachers are in the 60th percentile of managerial/professional norm data on the Job Stress Index. Managerial/professional was chosen

as the norm data over the other norm group offerings reported in the manual because it most closely resembled the population being studied. Secondary agriculture teachers are also in the 64th percentile on the Job Pressure Index and in the 58th percentile on the Lack of Support Index.

Table 2
North Carolina Secondary Agriculture Teacher Job Stress Results (*n* = 118)

	Agriculture Teacher Data		M/P Norm Data[a]
Index	*M*	*SD*	*% ile*
Job Stress	22.23	11.61	60
Job Pressure	26.89	14.31	64
Lack of Support	20.72	14.75	58

Note. [a]M/P= Managerial/Professional

Because this is an average, objective three sought to determine how many teachers had crossed into the stressed category. The JSS Manual indicates that the 70th percentile (M = 25.07), on the Job Stress Index is indicative of a stressed individual. Slightly less than half of the teachers (*f* = 57, 48.31%) fall into the stressed category (see table 3).

Table 3
Status of Secondary Agriculture Teachers in North Carolina (*n* = 118)

Status	*f*	%
Stressed	57	48.31
Unstressed	61	51.69

Stepwise multiple regression analysis was conducted to address research question four. The regression analysis was used to estimate the proportion of variance in job stress accounted for by the linear combination of selected teacher characteristics, including sex, marital status, number of children, years at current school, years of teaching experience, number of teachers in the department, exercise, hours/week at work, personality type, community support, and professional associations. Family/friend support was removed because the lack of variance made it a constant.

Only the Job Stress Index, as the dependent variable, was used in the regression as it is the omnibus measure which uses all 30 items from the Job Stress Survey. However, before conducting the regression, nine variables (marital status, number of teachers in department, years of teaching experience, number of children, years at current school, days a week of exercise, personality type, community support, and professional associations) of the 10 predictor variables were excluded from the regression analysis because of a low (<.10) bivariate relationship with the dependent variable. Of the remaining predictor variables (sex and hours per week at work) were independent (VIF) in their prediction.

The regression model (see Table 4) depicts the characteristic found to be significant in predicting Job Stress Index as a measurement of overall job stress. Four percent of the variance (Adjusted R^2 = .04; F (1, 91) = 5.08, $p < .05$) in agriculture teachers' Job Stress Index score can be predicted by teachers' sex, with females displaying a higher level of stress. The effect size of

sex was negligible (d =.05). By contrast, hours spent at work per week was not a significant predictor.

Table 4
Stepwise Regression of Predictors of Job Stress (Job Stress Index) among Secondary Agriculture Teachers (n = 118)

Variable	R	R^2	R^2 *Change*	b	t	p	*VIF*	ES
Included	.23	.05						
Sex[a]			0.11	6.01	2.25	.03	1.00	Negligible
(Constant)				14.53	4.05	.01		
Excluded								
Hours per week at work[b]				0.12	1.14	.26	1.06	

Adjusted R^2=.04; $F(1,91) = 5.08$, $p < .05$, Effect Size (ES) expressed as Cohen's d.
[a]Coded: 0 = Male, 1 = Female; [b]Coded: 1 = 36-45 hours, 2 = 46-55 hours, 3 = 56-65 hours, 4 = 66-74 hours, 5 = 75+ hours

Conclusions, Implications and Recommendations

As a general profile, secondary agriculture teachers in North Carolina are mostly male, have an average of 13 years of teaching experience, with over nine years at their current school. Nearly eighty percent work in one or two teacher departments. Nearly everyone reported receiving social support, and one-third reported being an extrovert. Almost all of these teachers are married, with an average of 1.32 children. Nearly ninety percent of teachers reported working more than forty hours per week, and exercising an average of 2.40 days per week.

Based upon the findings of the study, secondary agriculture teachers in North Carolina on average are not in a state of overall distress. According to the *Job Stress Survey manual*, stress scores above the 70th percentile on a comparable norm data suggest a state of distress. Job Pressure was the highest norm percentile score at 64. Interpreting these results with the use of the Yerkes-Dodson Principle (Olpin & Hesson, 2007) would indicate that some teachers are experiencing healthy, productive stress which is pushing them to excel; however, some of the teachers have reached their stress threshold and crossed into distress.

While secondary agriculture teachers are not in a state of overall distress, on average, they are approaching the threshold of bad stress. As the roles of secondary agriculture teachers continue to increase, they will eventually lead to a point of task saturation. With emerging changes in education, curriculum, accountability and standards, secondary agriculture teachers are being asked to do more without reducing responsibilities. The question is not whether secondary agriculture teachers will reach a state of distress, rather how long it will be before it occurs, and what can be done to prevent it.

It is necessary that the agricultural education profession recognize the status of teacher stress. Agriculture teachers, in general, and specifically in North Carolina must begin to examine their roles and responsibilities with a concerted effort to manage their stress levels into healthy tension for healthy performance. Organizational leaders must also heed the status of teacher

stress and become more sensitive to the demands placed on teachers. Task saturation is too much to do with not enough time, not enough tools, or not enough resources. Specifically, secondary agriculture teachers will be unable to take on additional duties if appropriate resources and support are not provided. School administrators and state leaders should continue to seek opportunities that offer an abundance of resources and assistance that will aid teachers in their roles. Furthermore, perhaps teachers need to be proactive in reducing their tasks to manageable levels, where, in theory, they can get ahead by letting go of tasks associated with little or no measurable program or student impact.

The single predictor of overall stress was sex, with females appearing to be more stressed than males. The findings are consistent with the related literature. This means female agriculture teachers are experiencing higher levels of job-related stress. Perhaps, for some, this is because of the "spillover effect" of traditional roles married females may be assuming at home (e.g., having tasks inside the house) and mothers with family responsibilities (e.g., child rearing) that are over and above that of an agriculture teacher, creating a work overload situation. Sensitivity should be paid to the stress levels of all agriculture teachers, but specifically females when planning teaching-related events. Consideration should be given to making events more family friendly; for example, by reducing the number of weekend and night time activities. Furthermore, teacher conference planners should entertain the idea of providing child care services for teachers who might benefit by the service, thus allowing them to balance their role as parent and teacher.

It is of interest to note that, of the 12 variables considered as predictors of job stress according to the literature, only one was found to be significant. The hours spent at work per week was not found to be predictive of stress while some variables had such a low correlation with the dependent variable that they were not going to be significant (number of teachers in department, number of children, personality type, exercise, marital status, and sources of social support). The items not being predictive is counter to the literature in most cases. It is interesting to note that almost all of our teachers showed some level of social support which is a coping mechanism for stress (Cohen & Willis, 1985; Shumaker & Czajkowski, 1994; Travers & Cooper, 1996). Perhaps the items which are stressors for other teachers are not stressors for agriculture teachers. Perhaps agriculture teachers as a group are quite similar to one another and the sample of this study was not large enough to show variance among the factors.

The literature indicated that teachers are stressed. However, this study did not uncover all of the components contributing to that stress. There would be benefit from further studies seeking to account for the unknown predictors of job stress in agricultural education including a specific instrument might be better able to explain the stress caused by items such as classroom management, FFA advisement, and Supervised Agricultural Experiences.

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A REGIONAL COMPARISON OF STRESS AMONG BEGINNING AGRICSCIENCE TEACHERS IN CENTRAL AND WEST TEXAS

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Abstract

The purpose of this study was to determine if there were regional differences in stress levels of beginning agricultural science teachers in Central and West Texas. Agricultural education professionals included in the study were secondary teachers. The target population for this study was secondary agricultural science teachers in the first or second year of teaching. All forty-eight (n = 48) beginning teachers from two selected regions of the state were identified. A census of the beginning teachers was taken. There was a 52% response among the 48 teachers. Fourteen (n = 14) teachers of the central region and eleven (n = 11) of the western region participated.

The Teacher Stress Inventory, a 49-item instrument, was used to measure stress levels (Fimian & Fastenau, 1990). Independent samples t-tests revealed there was a statistically significant difference between the groups on stress related to the time management factor. Western region teachers in the state expressed higher levels of concern for time management stress than the agriscience teachers from the central region of the state. However, other sub-scale factors, including work-related stress, professional stress, professional investment, and discipline did not reveal significant differences. Overall, the beginning agriscience teachers had slight to moderate stress.

Introduction and Theoretical/Conceptual Framework

The teachers involved in agricultural education at the secondary level often face time demands that extend well beyond a typical eight-hour work day. Professional development efforts targeting areas such as job satisfaction, stress, and time management are a reasonable approach to possible burnout, particularly with beginning teachers (McLean & Camp, 2000).

The teacher shortages in our public school system have been occurring at an alarming rate (U.S. Department of Education, 2009). Some school districts employ teachers who lack proper certification due to a shortage of teacher education program graduates who decide to pursue a teaching career. As a result, struggles may occur in the quality of instruction available to students (Camp, Broyles, & Skelton, 2002).

There are national efforts, such as the National Council for Agricultural Education 10 X 15: The Long Range Goal for Agricultural Education, whose goals include growing the number of agricultural education programs from 7,200 to 10,000 by the year 2015 (National FFA, 2008). A goal of more programs increases demand for trained teachers. There is a reported shortage of qualified agriscience teachers (Kantrovich, 2007). Prioritizing teacher recruitment and retention must be an area of focus to attain the goals of the 10 x 15 endeavor. Education research conducted by Ingersoll (2003) reported that staffing problems will not be solved if schools do not address the sources of low teacher retention.

Stress, defined by Maslach (1982), is the body's reaction to change which may be physical or environmental. Maslach, noted for research involving stress and burnout, identified the categorical stages one experiences including emotional exhaustion, depersonalization and reduced personal accomplishment. Working conditions, emotional or physical, cause stress. Elimination of stress as a solution is not possible according to Maslach. Control and prevention of becoming overstressed is the approach. The emotional levels as a result of any occupational strain could lead one to reach a level of frustration or high stress (Maslach, 1982). Consequently, stress ties directly to Herzberg's Two-factor Theory (Herzberg, 1959)

Herzberg, Mausner, and Snyderman (1959) indentified the top six factors which determine job satisfaction: achievement, recognition, work itself, responsibility, advancement, and growth. The top six factors which determine dissatisfaction (hygiene factors) were: company policy, supervisor, relationship with boss, working conditions, salary, and relationship with peers. Herzberg et al (1959) made a distinction between the two domains of job satisfaction and the theory was based on Maslow's hierarchy of needs (Maslow, 1943). Working conditions are factors which may cause stress to the beginning teacher, particularly during the first year.

The levels of the first year involve emotional reactions to the experience as modeled in the phases of a first-year teacher as presented by Moir, 2005. The model depicts the trend of the beginning teacher through the traditional academic calendar (see Figure 1).

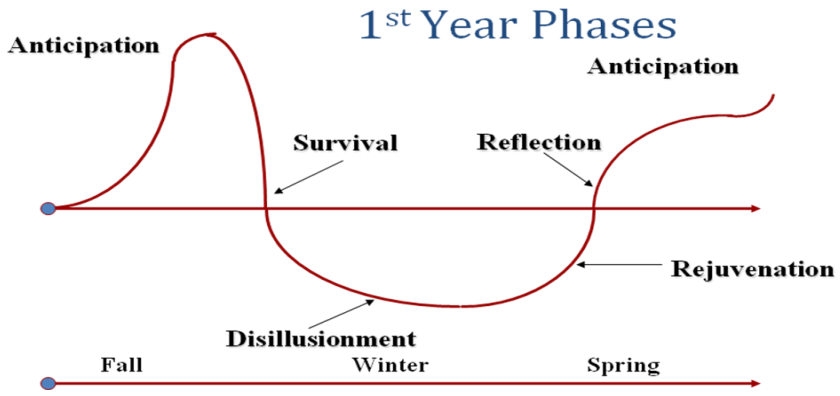

Figure 1. Phases of a first-year teacher (Moir, 2005).

The initial anticipation or elation of securing that first teaching position is soon followed by the anxiety of the reality of the day-to-day demands of the job. The model then depicts an increase toward a more satisfied level of agreement by the teacher as the growing pains of the break-in period begin to subside (Moir, 2005).

Geographical location or regional locale among teacher stress is not present in literature. Agriscience local needs, as a variable, may need attention. Larger states may have regional differences needing consideration among beginning teachers. Pressing issues have surfaced such as managing stress, balancing work and personal life, and time management (Myers, Dyer, & Washburn, 2005). Teacher job satisfaction levels should be addressed by teacher education programs through professional development including work and family balance (Chaney, 2007).

Single regions may need to be measured for the various induction teacher concerns. Research conducted on the inservice needs of agricultural science teachers found that teacher stress and time management were issues needing attention in teacher professional development (Roberts & Dyer, 2004). The statewide sample consisted of both traditional and alternatively certified teachers. Roberts and Dyer found teacher stress and time management as the largest professional development concerns among both of the sample groups.

Castillo and Cano (1999) found that females tend to leave the profession at a greater rate than males. Gender attrition issues may begin to play a considerable role in beginning teacher retention as two studies, Burris & Keller, (2007); and Burris, McLaughlin, Brashears, & Fraze (2008); reported one half of the teachers in studies involving beginning teachers to be female.

The strategy used to resolve or prevent stress and conflict in the agricultural education setting may help retain some quality teachers (Croom, 2003). Croom concluded that as teachers gain experience teaching, they cope to alleviate work-related stress. Croom and Moore (2003) found moderate stress and also reported experience as a coping tool. Stress-causing agents of the workplace have appeared to be a surprise to beginning teachers. According to Walker, Garton, and Kitchel (2004), assignments on campus are a surprise reality for new teachers at the secondary level. Moreover, a bad experience while student teaching may prevent many university graduates from entering the teaching profession (Osborne, 1992).

The factors which determine stress must be addressed taking a professional development approach (Walker et al., 2004). Torres, Lawver, and Lambert (2009), conducted a study on job-related stress and found that hours per week at work was the largest predictor of stress. Meister and Melnick (2003) concluded that 84% of new teachers reported feeling "overwhelmed by the workload" and recommended that "time management is another area where teacher preparation programs need a greater focus" (p. 92).

Purpose, Objectives, and Hypotheses

The purpose of this study was to determine if regional differences exist in stress levels of beginning agricultural science teachers in Central and West Texas. The following research objectives were used to conduct this study:

1. Describe the level of stress of beginning agriscience teachers.
2. Determine stress differences between teachers based on regional location of the state.

As a means of accomplishing the second objective of the study, the following null hypothesis was tested:

H_o: There is no difference in scores on stress for beginning teachers from the west region or the central region of the state.

Methods/Procedures

This study employed survey research to describe the stress of the beginning teachers and determine if there are regional differences. According to Fraenkel and Wallen (2006), the cross-sectional survey involves a predetermined population. In this case, the study involved beginning teachers in agriscience. Limitations of this design include that the study does not control for threats due to individual characteristics (Frankel and Wallen, 2006).

The target population for this study consisted of secondary agricultural science instructors in the first or second year of teaching. Subjects were chosen based on geographical region of the state. The names of the teachers were obtained from the 2008-2009 Vocational Agriculture Teachers Association of Texas (VATAT) data which included years of tenure. The accuracy of the list was confirmed by the individual school district web-based information, email, and telephone contacts. There was a total of 204 (N = 204) beginning teachers in the state. There were 48 (n = 48) beginning teachers in the selected regions. The researcher included all of beginning teachers from the identified regions.

Limitations of this study include sample size and locale. This study included a sample of beginning teachers in only two regions of Texas. It was a fairly small group in comparison to the entire state. Caution should be taken when making any inferences beyond the scope of this study. Researchers selected regions within the service area of the institution. The selected regions represent a distance of 600 miles north to south, and 550 miles east to west.

The researcher established the time of instrumentation *a priori* based on the Phases of a First Year model (Moir, 2005). The low point of emotional disillusionment occurs at mid-academic calendar, or December. Twenty-three (n = 23) of the beginning teachers in the western region and twenty-five (n = 25) instructors were contacted. The Teacher Stress Inventory (TSI) was used to measure the stress levels (Fimian & Fastenau, 1990).

The procedures for the instrumentation involved web-based questionnaires. Collection of data followed the procedures according to Dillman's (2007) tailored design method. The internet links accompanied by instructions were sent to the teachers along with an explanation of confidentiality of their response. The timeline of the data collection transpired through the month of December. The researcher obtained a 52% response rate. Fourteen (n = 14) of the central region teachers responded and eleven (n = 11) of the western region responded.

Fimian and Fastenau (1990) defined the ten factors of the 49-item TSI: *Professional stress* is how teachers see themselves as professionals. *Behavioral manifestations* are inappropriate ways to deal with stress. *Time management* is the "balancing act" related to teaching. *Discipline and motivation* are aspects of the teacher-student relationship. *Emotional manifestations* are ways that teachers respond emotionally to stress. *Work-related stress* consists of environment-specific events that are sources of stress. *Gastronomical manifestations* are stomach ailments related to stress. *Cardiovascular manifestations* are cardiovascular problems associated with stress. *Fatigue manifestations* are fatigue problems associated with stress. Participants rated each statement on a five-point scale including: *1) not noticeable, 2) barely noticeable, 3) moderately noticeable, 4) very noticeable* and *5) extremely noticeable* (p. 155).

Reliability was reported by a study conducted on 10-year aggregate data collected by the TSI author (Fimian & Fastenau, 1990). The Cronbach's alpha coefficients were greater than 0.75 and overall TSI alpha coefficient of 0.93. Fimian & Fasteneau conducted factor analyses on the TSI to refine the instrument

A brief demographics section including gender and ethnicity was included to describe the beginning teachers. Age was not included in the instrumentation. Mean scores, and standard deviations were used to analyze data which measured stress levels of the 25 (n = 25) agriscience teachers. The null hypothesis was tested using independent samples t-tests to compare the two groups' mean scores on the total stress and each of the ten factors of the TSI. The alpha level, which was established by the researcher *a priori*, was set at 0.05 (α = .05). Effect size was also calculated using the means and standard deviations to determine the Cohen's d coefficient.

Findings/Results

Research Objective 1. Describe the level of stress of beginning agriscience teachers.

There were ten factors or constructs in measuring the level of stress. The stress level of the beginning agriscience teachers was measured by the 49-item Teacher Stress Inventory (TSI) (Fimian & Fastenau, 1990). The mean for the beginning agriscience teachers was M = 2.95 (SD = .59). Therefore, the overall stress is *moderately noticeable* stress. Four of the constructs in the TSI measured above the noticeable level on the five-point scale: time management, work-related stressors, discipline and motivation, and professional stress. The TSI data by factor means are depicted in Table 1.

Table 1

TSI Mean and Standard Deviation by Stress Factor

	Total (*n = 25)*		
TSI Factor	*M*	*SD*	Rank
Time Management	3.83	0.77	1
Work-Related Stressors	3.77	0.74	2
Discipline and Motivation	3.56	0.98	3
Professional Stress	3.24	0.91	4
Emotional Manifestations	2.80	1.02	5
Professional Investment	2.78	0.84	6
Fatigue Manifestations	2.77	0.81	7
Cardiovascular Manifestations	1.72	0.73	8
Gastronomical Manifestations	1.50	0.65	9
Behavioral Manifestations	1.27	0.29	10

Note. 1 = Not Noticeable; 2 = Barely Noticeable; 3 = Moderately Noticeable; 4 = Very Noticeable; 5 = Extremely Noticeable.

Research Objective 2. Determine stress differences between teachers based on regional location of the state.

To test the null hypothesis, the summated mean scores on the TSI were compared between the two regions' teachers. The researcher compared the equality of means of the scores of the TSI using an independent samples *t*-test, with an alpha level established *a priori* at 0.05 (α = .05). According to Kirk (1982), the *t*-test is used to test a null hypothesis when comparing means of two groups.

There was not a significant difference, t (23) = 1.76, p = .09, between the groups on the overall mean scores analyzed using the TSI mean score ($p > .05$). Table 2 displays findings of the independent samples *t*-test in the TSI.

Table 2

Independent Samples t-test - Mean Scores of Beginning Teacher Stress by region

Group	*n*	*M*	*SD*	*t*	*p*
West Region	11	3.17	0.50	1.76	0.09
Central Region	14	2.77	0.62		

To further compare the ten subscale factors of the TSI, independent samples *t*-tests were conducted to compare equality of means by construct between the two groups. The only construct mean score with a statistically significant difference, t (23) = 2.71, p = .01, was Time Management. Table 3 displays the findings of the independent samples *t*-test for the Time Management factor, sub-construct.

Table 3

Independent Samples t-test - Mean Scores of Beginning Teacher Time Management Stress

Group	*n*	*M*	*SD*	*t*	*p*
West Region	11	4.25	0.50	2.71	0.01
Central Region	14	3.50	0.80		

The researchers elected to compare the mean scores and the standard deviations of the two regional groups of first and second-year agriscience teachers for practical differences on the individual stress factors using Cohen's *d* coefficients. Thalheimer and Cook (2002) suggested the relative size of Cohen's *d* coefficients to measure effect size for practical differences when comparing two groups. Table 4 displays the different effect sizes based on the Cohen's *d* coefficients.

Table 4

Relative Size of Cohen's d (Thalheimer and Cook, 2002)

Relative Size	Cohen's *d* Coefficient
negligible effect	(>= -0.15 and <.15)
small effect	(>=.15 and <.40)
medium effect	(>=.40 and <.75)
large effect	(>=.75 and <1.10)
very large effect	(>=1.10 and <1.45)
huge effect	>1.45

The TSI ten factor means and standard deviations by treatment group were analyzed and compared. Table 5 displays the means, standard deviations and effect size for the ten constructs, or TSI factors.

Table 5

A Comparison of Teacher Stress Factors, Effect Size by Region

	West		Central		Effect Size	
	n = 11		*n = 14*			
TSI Factor	*M*	*SD*	*M*	*SD*	*Cohen's d*	Effect
Time Management	4.25	0.50	3.50	0.80	*1.10*	Very Large
Emotional Manifestations	3.14	1.17	2.52	0.83	*0.65*	Medium
Work-Related Stressors	4.01	0.45	3.58	0.88	*0.62*	Medium
Professional Investment	3.04	1.02	2.57	0.62	*0.60*	Medium
Cardio- Manifestations	1.90	0.87	1.57	0.59	*0.47*	Medium
Gastronomical Manifestations	1.63	0.69	1.40	0.62	0.37	Small
Professional Stress	3.41	0.94	3.10	0.90	0.35	Small
Discipline and Motivation	3.72	0.97	3.42	1.01	0.32	Small
Behavioral Manifestations	1.31	0.29	1.23	0.30	0.28	Small
Fatigue Manifestations	2.87	0.81	2.68	0.82	0.24	Small

Cohen's *d* coefficients determined a very large effect size for Time Management. Medium effect sizes (>=.40 and <.75) resulted in the four sub-scale factors: Professional Investment, Emotional Manifestations, Work-Related Stressors, and Professional Stress.

The beginning teachers in the group were described according to demographic information including gender and ethnicity. Table 6 displays the demographics for the teachers.

Table 6

Summary of Demographic Data of Beginning Teachers by Region

	West		Central		Total	
	(*n* =11)		(*n* =14)		(*n* = 25)	
Demographic	*f*	*%*	*f*	*%*	*f*	*%*
Gender						
Female	4	36.4	6	42.9	10	40.0
Male	7	63.6	8	57.1	15	60.0
Ethnicity						
White	11	100.0	14	100.0	25	100.0

The central region of the state contained a slightly higher representation of females with 42.9% of the instructors being female compared to 36.4% in the western region. One hundred percent of the instructors were white, non-Hispanic in ethnicity.

Conclusions, Implications, and Recommendations

This study included a sample of beginning teachers in two regions of Texas. It was a fairly small group in comparison to the entire state. Limitations due to the sample size were a result. Caution should be taken when making any inferences beyond the scope of this study.

Most of the beginning teachers, or two thirds, are male. One third of the teachers are female. Although the majority of this study's participants are male, the female beginning teachers in the group imply that females are becoming more accepted into a traditionally male teaching role. Burris et al (2008) reported half of the beginning teachers in a study were female. The work and family balance retention issues with females may differ from the same issues with male teachers (Castillo & Cano, 1999). Time management as a concern with the agriscience teachers according to gender may be a variable needing exploration. Although females are represented, the ethnicity of the beginning teachers (100% white, non-Hispanic) may be interpreted that there is a possible diversity issue in agricultural education.

The beginning teachers are considered to have low to moderate stress. This finding is consistent with Croom & Moore (2003) who found a moderate level of emotional exhaustion. Four of the TSI factors were *moderate* to *very noticeable*, ranked from highest to lowest, included: time management, work-related stressors, discipline and motivation and professional stress. These findings coincide with Mundt and Conners (1999), Meister & Melnick (2003) and Roberts and Dyer (2004) who found time demands and work load are concerns for beginning teachers. This mid-range level of stress for beginning teachers may not sound alarming. However, mathematically, there were some concerns from beginning teachers which were rated on the *very noticeable* range of the stress index. Time management was one factor where beginning teachers need assistance.

There was not a statistically significant difference in stress levels between the two groups. However, among the ten constructs of the TSI, *time management* was statistically different when comparing the two regional groups. The time management concern implies that the profession should explore possibilities to localize efforts to identify needs of induction teachers. This finding was consistent with Cheney (2007) whose findings included hours working as an attrition concern among beginning teachers. Geographical location and local community demands of a teacher's time may be a concern for teacher retention in this crucial time of securing professionals.

Medium effect sizes indicated minor, practical differences between regions in *professional investment, emotional manifestation, and work-related stress*. These differences, although not statistically significant, show possibility that there is a need to serve induction

teachers according to the geographical differences based on these variables. Professional development through state staff and university faculty may need to explore these variables.

It is recommended that stress and time management research, which controls for gender, be conducted. Additionally, gender roles on work and family balance among agricultural science teachers should be explored similar to the study conducted by Cano and Miller (1992). Scholarly efforts in work and family balance should coincide with the national retention efforts in the profession including the National Research Agenda (2007) research priorities.

Teacher education programs should make efforts to teach comprehensive time management to pre-service agriscience teachers. It should be made clear that time management involves much more than organizing activity between school bells. There is also a need for beginning teachers to have a clear understanding of professional roles and the importance of work and family balance.

There is a need to explore ethnicity distribution among teachers in secondary agricultural education. Research involving recruitment and retention of university teacher education programs should examine the levels of diversity among agricultural education student populations along with students' intentions of entering the teaching profession.

This study should be replicated and involve random sampling and a larger sample size of induction teachers, or better yet, a census of the beginning teachers. Research should control for differences such as enrollment, school size, economy, and locale among the sample when measuring stress or work and family balance concerns. Furthermore, experimental and quasi-experimental studies should be conducted to determine effects of professional development seminars addressing induction teacher needs.

This study only involved first and second-year teachers. Further research is recommended to include agriscience teachers of varying tenure and locale. Additionally, investigations involving comparisons between agriscience teachers and other education professionals with abundant workloads, such as athletic coaches and band directors, should take place using a multi-disciplinary approach.

The agricultural education profession should encourage creative efforts and continue professional development toward induction teachers particularly during that initial wave of the workload shock of the middle of the school year. The use of contemporary methods to reach teachers should be employed in order to include a wider audience when geographical constraints may prevent attendance in professional development seminars.

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AN ANALYSIS OF OUTCOMES ASSOCIATED WITH CONDUCTING COUNTY PROGRAM REVIEWS IN COOPERATIVE EXTENSTION

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Abstract

Upholding and improving the quality of its educational programs has been a continuing priority for Cooperative Extension. The purpose of this study was to identify the outcomes resulting from conducting county program reviews in Florida. Extension agents in eight counties that participated in a 2008 county program review were surveyed to determine if their participation had affected their programming knowledge, attitudes, and behaviors. The results indicated agents increased knowledge of their programs' strengths and opportunities for improvement. Most agents took at least one programming action as a result of participating in the county program review, with an increased use of technology reported as the most common action taken. Fewer actions were reported at the county level. Taking action was related to an agent's perception of KASA outcomes. The county program reviews have the demonstrated potential to be a positive mechanism for improving programs. UF/IFAS Extension can maximize this value by communicating the importance of the county program reviews to agents and county offices, and by holding both accountable for their actions after a county program review.

Introduction

Educational programs are the identifying brand of Cooperative Extension. The Extension Committee on Organization and Policy's Leadership Advisory Council (2007) said enhancing the success of educational programs is an internal and external priority for Extension. The development of Extension programs is influenced by identified needs or current events (Lopez et al., 1999). Assessments of its educational programs may determine organizational changes within Extension (ECOP LAC, 2006). Rasmussen (1989) said the majority of Extension programs are first identified as a need on the local level and are carried out by the organization to meet the needs of citizens. Extension's educational programs are available to anyone who wishes to participate.

According to Kistler and Briers (2003), Extension programs should be continuously evaluated in order to measure quality and program impact. This is consistent with the National Research Agenda (Osborne, n.d.) which identified the need to examine appropriate nonformal educational delivery systems. Towards this end a formal needs assessment process, known as a county program review, was re-instituted in Florida in 2007 to improve the quality of Extension programming delivered at the county level (Benge & Harder, 2009). Jacob, Israel, and Summerhill (1998) described county program reviews as "a comprehensive assessment of the program delivery and educational services offered by the faculty and staff of a local Extension office" (¶ 1). Counties are selected by the extension administration to participate in county program reviews. Review teams of county and state extension faculty are formed based on technical expertise and the major program areas in the selected counties. The teams receive training at a workshop to increase each team member's knowledge of his/her role and the overall review process.

The selected counties participate in a two to four day review, based on the size of their county extension program. Faculty and staff in each program area and its corresponding stakeholders have a scheduled opportunity to dialogue with the review team. The review team also meets with a county administrator (e.g., county commissioner) during their visit.

The review teams are charged with developing a final report outlining the county's overall strengths, challenges, opportunities, and threats based on their observations and interactions with county faculty, staff, stakeholders, and county administration. Each individual program area is provided feedback regarding strengths and opportunities. Each county office is required to draft a response and subsequent plan of action based on the results of the review.

Maintaining quality programs is critically important for an organization such as Cooperative Extension because of the role that its continuing education programs play in the betterment of society. Boyle (1981) stated: "It is up to the professional leadership of continuing education to provide [lifelong learning opportunities]; otherwise, we face the prospect of having large numbers of citizens permanently restricted in their ability to grow" (p. 3). This article describes research conducted to identify the outcomes resulting from the county program review process in Florida. The results from this study will provide a foundation for understanding the effectiveness of the county program review process as a means for improving extension program

quality, which may prove informative not only for Florida but for other state extension systems interested in program improvement.

Theoretical/Conceptual Framework

In their Targeting Outcomes of Programs (TOP) Model, Rockwell and Bennett (2004) theorized changes in knowledge, attitudes, skills, and aspirations (KASA) have to occur prior to changes in practice. According to Bennett and Rockwell, "practices are patterns of behaviors, procedures, or actions" (1995, ¶ 16). Practice changes may ultimately lead to changes in social, economic, or environmental conditions (Bennett & Rockwell). Although the TOP Model was originally developed to describe the outcomes of educational programs, it is useful to assess KASA and practice outcomes in order to understand how individuals and organizations respond following other change strategies, such as needs assessments.

The conceptual model (see Figure 1) for the study was developed by Harder et al. (2009) from Boyle's (1981) adaptation of field theory and the work of English and Kaufman (1975), Witkin and Altschuld (1995), and McLean (2006). Changes in the environment may sometimes create disequilibrium for the individual when what is currently happening differs from what an individual perceives to be ideal (Boyle). English and Kaufman (1975) and Witkin and Altschuld (1995) advocated the use of needs assessments as a systematic method of determining individual and organizational needs. McLean (2006) said the potential exists for positive and negative results to occur following a needs assessment.

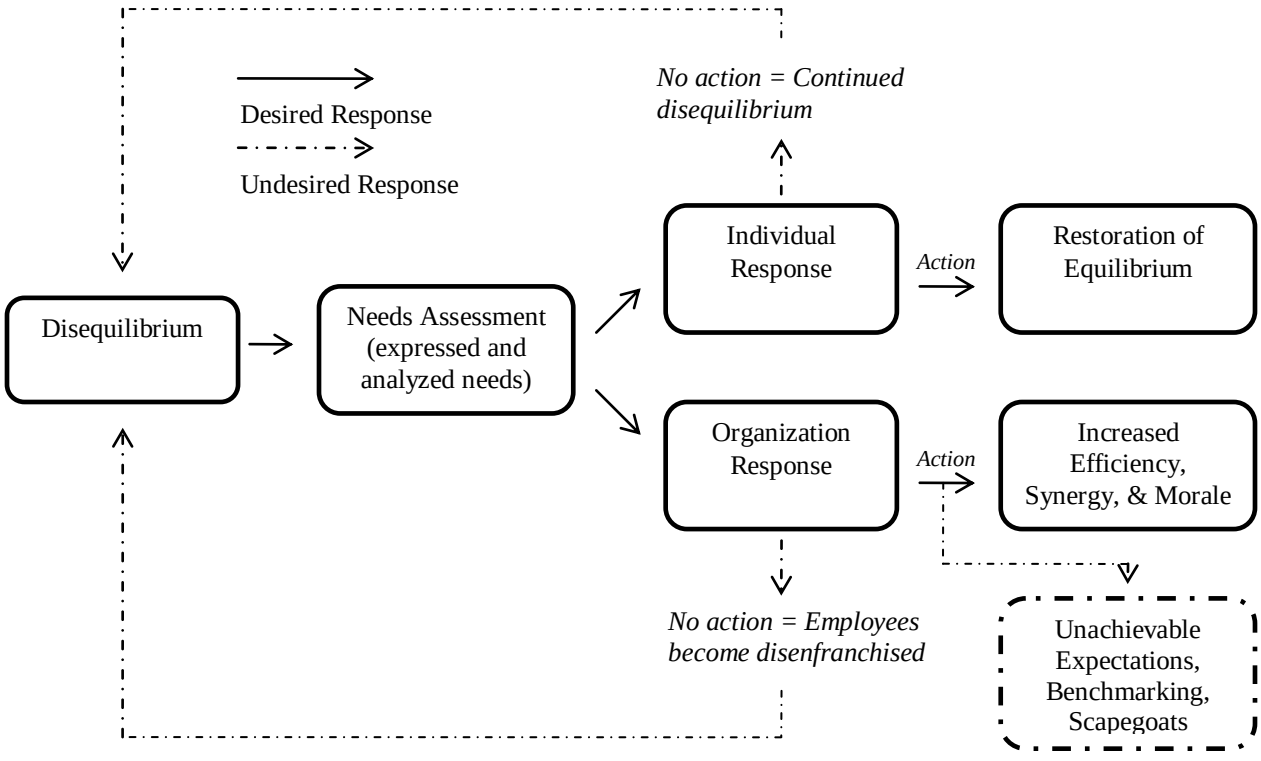

Figure 1. Model for the needs resolution process (Harder et al., 2009).

Note. From "An analysis of the priority needs of Cooperative Extension at the county level," by A. Harder, A. Lamm, and R. Strong, 2009, *Journal of Agricultural Education, 50*(3), p. 13. Reprinted with permission.

In the context of this study, changes in KASA were examined to help determine why extension agents and county offices did or did not take action (change practice) following their participation in a county program review. The results should provide insight into the potential for achieving long-term positive or negative outcomes for the counties as a result of participating in a county program review.

Purpose/Objectives

The purpose of this study was to identify the outcomes resulting from the county program review process in Florida. The first objective was to describe how extension agents perceived potential changes in their knowledge or attitudes resulting from participating in a county program review. The second objective was to describe the actions that extension agents took as a result of participating in a county program review. The third objective was to describe the actions taken at the county level as a result of participating in a county program review. The fourth objective was to determine if differences existed in actions taken based on KASA changes.

Methods/Procedures

This study used a mixed method approach. Eight counties were purposively selected by UF/IFAS Extension administration to participate in the 2008 county program reviews. The extension agents working in those eight counties were surveyed approximately one year later. Seventy-five agents were still employed in the same counties when this study was collected, according to each county's Web site and the university's Cooperative Extension directory. Nine agents were no longer employed by Extension or in the same counties.

A researcher-developed questionnaire was used to collect data online using Survey Monkey. An expert panel reviewed it for content validity. Questions were developed based on Rockwell and Bennett's (2004) Targeting Outcomes of Programs (TOP) model.

The first section of the questionnaire asked agents to indicate their level of agreement for five Likert-type questions about KASA outcomes resulting from the county program reviews by using a six point scale (1 = *Strongly Disagree*, 2 = *Somewhat Disagree*, 3 = *Slightly Disagree*, 4 = *Slightly Agree*, 5 = *Somewhat Agree*, 6 = *Strongly Agree*). The scale was interpreted as follows: *Strongly Disagree* = 1.00 – 1.50, *Somewhat Disagree* = 1.51 – 2.50, *Slightly Disagree* = 2.51 – 3.50, *Slightly Agree* = 3.51 – 4.50, *Somewhat Agree* = 4.51 – 5.50, *Strongly Agree* = 5.51 – 6.00. Reliability for this section was calculated *ex post facto* at .91. The second section of the questionnaire contained two open-ended questions: (a) what changes did you make in your programs as a result of the county program review, and (b) what changes were made within your county office as a result of the county program review? A limitation of the study is the use of self-reporting.

Dillman, Smyth, and Christiansen's (2009) Tailored Design Method for Internet questionnaires was used to collect data. One reminder was sent in an effort to increase response rate (Dillman et al., 2009). The American Association for Public Opinion Research's (2008) guidelines for reporting response rates were used. Response Rate 1, the most conservative estimate of response rate, was 57.50%. In accordance with AAPOR guidelines, the disposition codes used to determine this response rate have been included in Table 1. No significant differences existed between early and late respondents when their quantitative responses were compared, therefore the quantitative results can be generalized to the target population (Lindner, Murphy, & Briers, 2001).

Table 1
Disposition codes used to calculate response and outcome rates

Disposition Type	Final Disposition Code	*n*
Interview (Category 1)		
Complete	1.00	42
Partial	1.20	0
Eligible, non-interview (Category 2)		
Breakoff/Implicit refusal	2.12	8
Unknown eligibility, non-interview (Category 3)		
Nothing returned	3.19	20
Mail returned undelivered		3
Not eligible (Category 4)		
Out of sample – other strata than originally coded	4.10	2

Note. Cooperation Rate 1 = 84.00%. Refusal Rate 1 = 11.00%. Contact Rate 1 = 68.50%.

Descriptive statistics were used for the first objective. Content analysis was used for the second and third objectives. According to Merriam (1989), content analysis "involves the simultaneous coding of raw data and the construction of categories that capture relevant characteristics of the document's content" (p. 160). Triangulation was accomplished by having multiple investigators participate in the qualitative data analysis and a member check was conducted by e-mailing the results of the survey to respondents. An audit trail has been included in the findings/results. These steps were taken to increase the trustworthiness of the study, as recommended by Lincoln and Guba (1985).

The non-parametric Mann-Whitney *U* test was used for the fourth objective, due to the small group sizes. Respondents' mean scores for the five KASA statements were used to determine if a significant difference existed between respondents categorized as "taken action" or "no action." Only individual level, not county level, responses were considered for categorization. Level of significance was determined *a priori* at .05.

Results/Findings

Objective One: KASA Outcomes

The first objective was to describe how extension agents perceived potential KASA outcomes resulting from participating in a county program review (see Table 2). Agents somewhat agreed participating in a county program review helped them to recognize the strengths of their programs (M = 4.52, SD = 1.19). Agents slightly agreed participating in a county program review: increased their awareness of opportunities to strengthen their programs (M = 4.24, SD = 1.19), increased their awareness of challenges affecting their county's ability to deliver educational programming (M = 4.05, SD = 1.25), helped improve programming in their counties (M = 3.95, SD = 1.29), and increased their knowledge of threats facing their county's ability to deliver educational programming (M = 3.60, SD = 1.34).

Table 2
Agents' perceptions of KASA outcomes

Statement	*M*	*SD*
The County Program Review helped me to recognize the strengths of my programs.	4.52	1.19
I increased my awareness of opportunities to strengthen my programs as a result of the County Program Review.	4.24	1.19
I increased my awareness of challenges affecting my county's ability to deliver educational programming as a result of the County Program Review.	4.05	1.25
I believe the County Program Review process helped improve programming in my county.	3.95	1.29
The County Program Review increased my knowledge of threats facing my county's ability to deliver educational programming.	3.60	1.34

Note. Scale: 1 = *Strongly Disagree*, 2 = *Somewhat Disagree*, 3 = *Slightly Disagree*, 4 = *Slightly Agree*, 5 = *Somewhat Agree*, 6 = *Strongly Agree*.

Objective Two: Individual Actions

The second objective was to describe any actions that extension agents took as a result of participating in a county program review. Twenty-nine agents took at least one action. Seven agents indicated they had not taken any new actions following the county program review. The themes that emerged from the content analysis are presented in italics for emphasis.

The most prevalent action taken was an *increased use of technology*. Web sites were improved with more educational information (R14), general maintenance and the addition of a blog (R3). One agent indicated he/she made "more use of the website" (R10) while another did a "better job of making my advisory commitee [*sic*] aware of my website" (R12). Agents also increased their use of other technologies. An agent stated "I am in the process of changing some of the delivery methods, primarily by incorporating new technologies (Podcasts, narrated PowerPoints) into programing [*sic*]" (R34). Another agent stated "The biggest change was a

shift towards the exploration [of] how distance delivery technology can help in the delivery as well as the evaluation of my programs" (R42).

Agents reported *focusing their programs* as a result of participating in a county program review. Two agents (R2, R13) reported an increased focus on specific topics for their programs while another respondent (R25) decreased the number of environmental programs being offered. Similarly, an agent reported structuring "programs to suit very specific audiences" (R5). A different approach was taken by the agent (R26) who did not focus programs based on topics or audience, but rather was able to focus programming by incorporating measurable objectives.

An *increased emphasis on diversity* was evident. The emphasis included tracking the race and gender of program participants (R17) and changing press releases "to better feature affirmative action statements" (R19). Programmatically, agents reported planning "more programs in rural areas of the county" (R22), "increasing the number of non-traditional programs" (R23), and looking for "more opportunities for minority programming" (R30). Finally, the same agent who talked about changing press releases indicated he/she was also "searching for members of our advisory committee that will make it more culturally diverse" (R19).

An *increased focus on advisory councils* was the last of the common actions identified. Two agents made membership changes by establishing a membership rotation (R16) and adding a new member (R31). One agent "worked more with [my] advisory committee to identify program needs" (R14). The most intensive focus was evidenced by the respondent (R29) who reported:

> We held a TOTAL Advisory Committee [meeting] - with ALL advisory committee members invited to a dinner after the Review. They discussed the Review Teams Recommendations & provided timeframes for implementation. I will be forced :-) [*sic*] to review their recommendations. Our 2nd annual (now) Total Advisory meeting will be in August. I believe this effort is worthwhile and will keep me on task.

Objective Three: County Level Actions

The third objective was to describe any actions taken at the county level as a result of participating in a county program review. Fourteen agents listed at least one action taken by their office. Ten agents indicated they did not know of any actions taken or that their office had not taken any actions. The themes that emerged from the content analysis are presented in italics for emphasis.

Improved office communication was the primary theme that emerged from the analysis of actions taken. One agent reported "There were more collaborations of programs throughout the office as a result of the review" (R18). Another agent stated "We are more aware now of each other's programatic [*sic*] efforts and see more of a big picture of the overall extension effort in the county" (R25). Communication with clientele improved in at least one office, according to the agent who reported "Clientele were directed to the correct contact person more frequently" (R5).

To a lesser extent, actions were taken to *increase marketing and visibility*. One county added a new office in the southern end of the county to better market its programs to the growing population in that area (R1). Another county "developed a marketing strategy and publication" (R26). Finally, an agent reported his/her office had "focused more on being visible and accesable [*sic*] to all of our very diverse county demographics" (R34).

Objective Four: Differences in KASA

The fourth objective was to determine if differences existed in actions taken based on KASA changes. Respondents who reported taking action following the county program review tended to slightly agree (M = 4.37, SD = .84) they had improved KASA outcomes while respondents who had not taken action tended to slightly disagree (M = 3.47, SD = 1.28). The two sets of means were statistically different ($U(1) = 105.50$, $Z = -2.42$, $p < .05$).

Conclusions

The purpose of this study was to understand the outcomes resulting from conducting a county program review in Florida. KASA (Rockwell & Bennett, 2004) changes were observed. Agents tended to believe the county program review process helped improve programming in their counties.

Changes in practice (Rockwell & Bennett, 2004) also resulted from the county program reviews and were related to agents' perceptions of KASA outcomes. The most common actions taken by agents were categorized as: increased technology use, focusing programs, increased emphasis on diversity, and increased focus on advisory councils. The most common actions taken by county offices were categorized as improved office communication and increased marketing and visibility efforts. Fewer agents reported changes in practice at the county level versus individual program changes.

Implications

Witkin and Altschuld (1995) said the results of a needs assessment may be used to help move an organization towards its desired results. In the case of the county program reviews, the desired results are improved educational programs. This study showed agents appeared to gain a sufficient enough amount of knowledge during the county program review to prompt them to take actions to improve their programs. Most agents took at least one action, suggesting the county program reviews can stimulate agents to change their programming practices.

The needs resolution model developed by Harder et al. (2009) indicated there are individual and organizational benefits that may result when action is taken following a needs assessment. At the individual level, equilibrium is restored. Though this study did not explicitly seek to understand what the restoration of equilibirium means for an agent, it is logical to presume agents only took those actions they perceived to be beneficial. This is a promising finding as the organizational structure of Extension places the greatest amount of responsibility for educational program quality on the individual agent.

A lesser degree of effectiveness can be attributed to the effect that the county program reviews have at the organizational level. Only 35% of the responding agents indicated their offices had taken any kind of action following the county program review. That means the potential organizational benefits derived from conducting a needs assessment, such as the county program reviews, are going largely unrealized in the counties (Harder et al., 2008; McLean, 2006). County offices are missing opportunities to increase overall efficiency, synergy, and morale if they fail to act upon the results of the county program reviews. A potentially more serious consquence is that employees may become disenfranchised if they believe the county program review process is not valued by the organization, as evidenced by a lack of organizational action. Disenfranchised employees will not be positive assets in the effort to increase educational program quality and may be less likely to sustain any positive changes in practice they made as individuals.

Similarly, this study found that agents with positive perceptions of their KASA outcomes were more likely to adopt new practices than agents with negative perceptions. This is consistent with Bennett and Rockwell (1995), who said changes in practice are unlikely to take place if program participants do not gain enough knowledge and skills or form the appropriate attitudes and aspirations. It is troubling to find that agents' personal perceptions can interfere with their adoption of practices that have been formally recommended to improve their program quality. UF/IFAS Extension must find a way to increase agents' perceptions of KASA outcomes if it is to achieve its goal of program improvement.

Recommendations

More research is needed regarding the effectiveness of conducting county program reviews as a method for improving the quality of educational programs. This study used self-reporting to measure the objectives; future studies may benefit from a more rigorous research design. The findings from this study show promising changes in practice at the individual levels, but it is too soon to know if these changes in practice will be sustainable. Research is needed to understand the long-term effects of the county program reviews. At the individual and organizational levels, research is needed to understand the barriers to taking action following the county program review.

Recommendations for practice are focused on encouraging agents and county offices to take action following participation in a county program review. The majority of agents and offices must "buy-in" to the value of the county program reviews in order for them to have long-term impact. While offices are supposed to outline plans for implementing the county program review recommendations in a written response, this has not always happened. UF/IFAS Extension administrators must consistently communicate the importance of the county program reviews and hold agents and offices accountable for developing *and* implementing strategic plans. Doing so will be key to realizing the full benefits of the county program review process.

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A COMPARISION OF THE INSERVICE NEEDS OF TRADITIONALLY AND ALTERNATIVELY CERTIFIED BEGINNING AGRISCIENCE TEACHERS IN LOUISIANA

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Abstract

Recently there has been an influx of alternatively certified agriculture education teachers entering the profession. Regardless of certification method agriculture education teachers desire and need inservice training. However, are the needs of traditionally and alternatively certified beginning agriculture teachers similar? Little research exists that documents the inservice needs of alternatively certified teachers, much less alternatively certified beginning teachers. The purpose of this study was to determine the inservice needs of traditionally and alternatively certified beginning agriculture teachers and to what extent did differences exist in the inservice needs between those groups. Based upon the findings of this study, agriscience teachers indicated little need for inservice education. There were no significant differences of inservice needs between alternatively and traditionally certified teachers, when comparing grand means of larger constructs. However, differences did exist when comparing specific competency items within constructs. This study modeled the work conducted by Roberts and Dyer (2004), and given the difference in findings, the authors recommended that other states carry out this study so that university faculty and state staff can identify and address the needs of agriculture teachers in their respective states.

Introduction/Theoretical Framework

Effective teachers are developed through pedagogical coursework and clinical preparation (Darling-Hammond, 2000). However, in the effort to fill position vacancies, some state departments of education have developed alternative-certification policies requiring few pedagogical experiences before obtaining a position. These alternative-certification methods currently enable mid-career adults to enter the teaching profession with only an undergraduate degree and passing a general exam which measures basic skills in reading, writing, and mathematics. Individuals then obtain teacher certification by completing pedagogically-based courses while employed as a full-time teacher, which in some states can take up to five years. From this, one could make the assumption that inservice needs of alternatively certified agriscience teachers are different than the traditionally certified teachers given the difference in age, backgrounds, and training. However, we should ask the question, are these needs significantly different?

The states that are currently allowing teachers to enter the field prior to completing pedagogical coursework may not be doing so for ideological reasons. There may not be any other choice. Camp, Broyles, and Skelton (2002) indicated that there has been a shortage of university-prepared agriculture teachers for over 40 years. As a result, school administrators have been left little choice but to fill vacancies with uncertified or alternatively certified teachers. Therefore, with this influx of alternatively-certified agriculture teachers, it becomes vitally important to assess and inservice these teachers in an attempt to provide them the skills necessary to be successful.

Agricultural education is not a static profession in the content taught or instructional methods. Discoveries, inventions, and technological advancements are made daily that impact the lives of agricultural education teachers. Not only do these discoveries affect how these teachers teach, but what they teach, as well. Due to the ever-changing world of agricultural education, the National Research Agenda (2007) called for an assessment of the professional development needs of current agricultural educators. As a result, inservice programs are employed to meet agriculture teachers' needs to ensure their skills are current (Barrick, Ladewig, & Hedges, 1983; Duncan, Ricketts, Peake, & Uesseler, 2007). Inservice programs administrators are often left with the responsibility to determine what appropriate topics to include (Barrick, et al.). Roberts and Dyer (2004) indicated that this problem may be a result of the different experiences that alternatively and uncertified teachers possess when compared to traditionally certified teachers. It could be assumed that these two groups do not have the same inservice needs (Roberts & Dyer). Due to the potential differences, needs assessments have been conducted to determine appropriate topics to be included in inservice programs (Andreasen, Seevers, Dormody, & VanLeeuwen, 2007; Birkenholz & Harbstreit, 1987; Claycomb & Petty, 1983; Duncan, Ricketts, Peake, & Uesseler, 2006; Edwards & Briers, 1999; Garton & Chung, 1996; Harris, 2008; Joerger, 2002; Layfield & Dobbins, 2002; Washburn, King, Garton, & Harbstreit, 2001). Determining the needs for beginning teachers is also vital in preparing inservice and induction programs. Previous researchers have indicated that beginning teachers have different needs than experienced teachers. Claycomb and Petty (1983) concluded that the needs of teachers change as they become more experienced. Several researchers have indicated the needs specific to beginning teachers. A summary of these findings are found in Table 1.

Research from other education disciplines indicates that differences exist in the inservice needs of traditionally and alternatively certified teachers (Truell, 1999; Wayman, Foster, & Mantle-Bromley, 2003). However, little is known about the inservice needs of alternatively certified agriculture teachers, even more so about alternatively certified beginning teachers. Roberts and Dyer (2004) reported that alternatively certified teachers in Florida indicated their greatest inservice needs were preparing proficiency award applications, preparing for career development events, changing the curriculum to meet changes in technology, advances in biotechnology, writing grant proposals for external funding, building the image of agriculture programs and courses, recruiting and retaining quality students, managing and reducing work-related stress, and time management tips and techniques. Roberts and Dyer indicated that knowledge of these differences in teacher needs could assist program administrators in providing the necessary inservice for both groups of teachers. Their question "Do these results hold true in other states?"(p. 69) was seen as a call to action to replicate the study in Louisiana.

The Borich (1980) needs assessment model has often been used by researchers in agricultural education to determine inservice needs of secondary agriscience teachers. The steps in this model include: 1) determine competencies, 2) administer survey of competencies to teachers, 3) rank competencies in order of importance as evident from data, 4) compare high priority competencies with instructional programming, and 4) either revise instructional program, or revise competencies (Borich). Likewise, this study will follow the principles of the Borich model to determine inservice needs of beginning agriscience teachers in Louisiana for the purpose of improving instructional programming in the state for both alternatively and traditionally certified agriscience teachers.

Table 1
Summary of Inservice Needs of Beginning Teachers

Inservice Need	Researcher(s)
Advisory committees	Garton & Chung, 1996 Joerger, 2002 Layfield & Dobbins, 2002
Student motivation and leadership	Edwards & Briers, 1999 Washburn & Dyer, 2006
FFA award and proficiency applications	Garton & Chung, 1996 Joerger, 2002
Classroom management	Joerger, 2002 Washburn & Dyer, 2006
Program planning, marketing, and public relations	Garton & Chung, 1996 Edwards & Briers, 1999 Joerger, 2002 Torres, Ulmer, & Aschenbrener, 2008
Career Development Event (CDE) preparation	Birkenholz & Harbstreit, 1987 Layfield & Dobbins, 2002 Washburn & Dyer, 2006
Supervised Agricultural Experience (SAE) programs	Birkenholz & Harbstreit, 1987 Garton & Chung, 1996

	Washburn & Dyer, 2006
Technology integration	Birkenholz & Harbstreit, 1987 Garton & Chung, 1996 Edwards & Briers, 1999 Joerger, 2002
Completing reports and paperwork	Garton & Chung, 1996 Washburn & Dyer, 2006
Fundraising	Layfield & Dobbins, 2002 Washburn & Dyer, 2006
Establishing support groups/partnerships	Joerger, 2002 Torres, Ulmer, & Aschenbrener, 2008
Conducting and managing FFA activities/program	Garton & Chung, 1996 Edwards & Briers, 1999

Purpose/Objectives

Research priority area number four of the National Research Agenda in Agricultural Education and Communication (Osborne, n.d.) calls for research in agricultural education in public schools to "Prepare and provide an abundance of fully qualified and highly motivated agriscience educators at all levels" (p. 20). The topic of inservice needs of beginning teachers falls under the priority initiative, "Assess the professional and continuing education needs of agricultural educators" (p. 20). Using the study conducted by Roberts and Dyer (2004) as a model, the central purpose of this study was to compare the inservice needs of traditionally and alternatively certified beginning agriculture teachers. To achieve this purpose, this study had three objectives:

1. To describe the self-perceived inservice needs of traditionally certified beginning agriculture teachers.
2. To describe the self-perceived inservice needs of alternatively certified beginning agriculture teachers.
3. To compare group differences in inservice needs between traditionally and alternatively certified agriculture teachers.

Procedures

The instrument used in this study was adapted from the study conducted by Roberts and Dyer (2004). The instrument was developed using the principles identified in the Borich (1980) needs assessment model (Garton & Chung, 1996; Roberts & Dyer, 2004), and altered only by replacing educational terms relevant to Florida with the equivalent terms used in Louisiana. A panel of experts reviewed the survey after the terminology changes to assess content and face validity. The instrument contained 80 items and was divided into the following constructs: program management and planning (15 items), teacher professional development (4 items), FFA and SAE supervision (9 items), instruction and curriculum (19 items), and technical agriculture (33 items). Respondents were asked to rate their need for inservice education for each item

using a five-point Likert-type scale, and was also provided a blank space to write in other inservice needs not listed in the instrument. The scale ranged from one indicating "not needed" to five indicating "very strong need". Roberts and Dyer, in their study, had also submitted the instrument for face and content validity by an expert panel, and estimated reliability using Cronbach's alpha. Construct reliability alpha values were .95, .91, .88, .95, and .91 respectfully for the instrument (Roberts & Dyer). Means and standard deviations were determined respective to the objectives of the study, while independent sample t-tests were used to compare group differences between alternatively and traditionally certified teachers.

State agricultural education program specialists in Louisiana provided the researchers with a complete list of agriculture teachers who had completed less than three years of teaching agriculture within the state ($N = 41$). The instrument was mailed to these agriculture teachers during the first week of October, 2008 and late respondents were sent a reminder once a week for three weeks. A total of 29 agriculture teachers agreed to participate and completed the instrument, providing a 71% response rate. Because of the acceptable response rate (Ary, Jacobs, & Razavieh, 2005), there was no follow-up with non-responders.

For the purposes of this study, and consistent with the study conducted by Roberts and Dyer (2004), a traditionally certified teacher was defined a teacher who qualified for certification by earning an undergraduate degree in agricultural education. Alternatively certified teachers were defined as those who earned their certification by either completing an alternative certification program at a university in Louisiana or applied directly to the state department of education for teacher certification.

Findings

Demographics

Of the 29 respondents with usable data it was found that slightly more than one-third ($n = 10$) were traditionally certified in agricultural education. Of the remaining respondents, 10 majored in an agricultural discipline, two majored in science, and seven majored in an unrelated discipline. Twenty-two (76%) had completed a bachelor's degree, six (20%) had earned a master's degree, and one (4%) had earned a Ph.D. Three (10%) respondents strictly taught at the middle school level, 23 (79%) taught at the secondary level, two (7%) taught at both levels and one (4%) did not indicate a level. A majority of the respondents (67%) were male.

Program Planning and Management

The grand mean for traditionally certified teachers for program planning and management was 2.43 ($SD = 1.04$). Exactly one-half of the traditionally certified teachers indicated a high need for inservice in writing grant proposals for external funding (50%). These teachers indicated very little inservice needs in utilizing a local advisory committee, conducting needs assessments, developing business/community relations, establishing a public relations program, building the image of agriculture programs and courses, building collaborative relationships, and working with local media. Alternatively certified teachers had a grand mean of 2.72 ($SD = 1.05$) for this construct. The majority of alternatively certified teachers indicated a high need for inservice in writing grant proposals for external funding (63%); findings similar to Roberts and Dyer (2004). There were no other inservice needs suggested by these respondents. A two-tailed independent sample t-test was conducted to compare grand means between the traditional and alternative certification groups, but the grand mean difference of 0.29 points was not significant ($t = 1.08$, $p = .29$) indicating no difference of inservice needs in the area of

program planning and management. A summary of this data is presented in Table 2.

Teacher Professional Development

The grand mean for traditionally certified teachers for the teacher professional development construct was 2.23 (*SD* = .93). As presented in the table, few teachers indicated a need for inservice instruction in any of the topic areas. Two teachers indicated that instruction in managing and reducing work-related stress and time management tips and techniques would be beneficial. The grand mean for alternatively certified teachers was 2.48 (*SD* = 1.06), a 0.25 point difference from the traditionally certified agriscience teachers. Although more alternatively certified teachers specified needs for inservice in professional development, no topic area had more than a third of the respondents suggesting a high need. This is in stark contrast to the findings of Roberts and Dyer (2004), who found that over half of the respondents indicated inservice needs in managing and reducing work-related stress, time management and techniques, and professional growth and development. Utilizing a two-tailed independent sample t-test, the researchers examined if there were significant differences between the grand means of these two groups. No significant difference was found ($t = 0.78$, $p = .45$) indicating no difference of inservice needs in the area of professional development. A summary of this data is presented in Table 3.

Table 2

Teachers with High Needs in Program Management and Planning by Certification Method

	Traditional (n = 10)		Alternative (n = 19)	
	M = 2.43 (1.04)		M = 2.72 (1.05)	
Item	*f*	%	*f*	%
Writing grant proposals for external funding	5	50	12	63
Developing an adult program	4	40	4	21
Recruiting and retaining quality students	3	30	5	26
Managing learning labs	3	30	4	21
Evaluating the local agriculture program	3	30	3	16
Fundraising	2	20	6	31
Completing reports for local and state administrators	2	20	5	26
Planning and maintaining a school land lab	2	20	3	16
Utilizing a local advisory committee	1	10	6	31
Conducting needs assessments	1	10	4	21
Developing business/community relations	1	10	4	21
Establishing a public relations program	1	10	4	21
Building the image of agriculture programs and courses	1	10	3	16
Building collaborative relationships	1	10	3	16
Establishing a working relationship with local media	1	10	2	11

Note. Standard deviation in parenthesis next to mean value. Scale: 1 = no need, 2 = some, 3 = moderate, 4 = strong 5 = very strong. Frequency determined by number of beginning agriscience teachers indicating "very strong" inservice needs.

Table 3
Teacher Professional Development Needs by Certification Method

	Traditional (n = 10)		Alternative (n = 19)	
	M = 2.23 (0.93)		M = 2.48 (1.06)	
Item	f	%	f	%
Time management tips and techniques	1	10	6	31
Managing and reducing work-related stress	1	10	1	5
Professional growth and development	0	0	2	11
Becoming a member of the total community	0	0	1	5

Note. Standard deviation in parenthesis next to mean value. Scale: 1 = no need, 2 = some, 3 = moderate, 4 = strong 5 = very strong. Frequency determined by number of beginning agriscience teachers indicating "very strong" inservice needs.

FFA and SAE Supervision

The grand mean for traditionally certified teachers in the construct of FFA and SAE supervision was 3.26 (SD = 1.16). As indicated by the percentage of teachers with a high need, the greatest needs for inservice education were for preparing proficiency award applications (70%), preparing FFA degree applications (60%), and organizing and maintaining an alumni association (50%). The grand mean for alternatively certified teachers was 3.23 (SD = 1.21). The inservice needs rated highest were preparing proficiency award applications (63%), preparing FFA degree applications (63%), and preparing POA and national chapter applications. To compare traditionally and alternatively certified agriculture teachers based on FFA and SAE supervision inservice needs, an independent sample t-test was conducted. The test provided evidence that no significant difference existed between the two groups (t = -0.56, p = .96). However, note that traditionally certified teachers expressed higher levels of inservice need (50% to 26%) in the area of organizing and maintaining an alumni association as compared to their alternatively certified counterparts. On the other hand, alternatively certified teachers indicated a much higher need (58% to 40%) for inservice training to prepare program of activities (POA) and national chapter applications. These findings are not all-together surprising. It would be assumed that traditionally certified teachers would have had more opportunities to gain experience in these areas during pre-service teaching programs. Table 4 presents additional data regarding these agriscience teacher responses.

Table 4
Teachers with High Needs in FFA and SAE Supervisions by Certification Method

	Traditional (n = 10)		Alternative (n = 19)	
	M = 3.26 (1.16)		M = 3.23 (1.21)	
Item	f	%	f	%
Preparing proficiency award applications	7	70	12	63
Preparing FFA degree applications	6	6	12	63
Organizing and maintaining an alumni association	5	50	5	26
Preparing POA and National Chapter Applications	4	4	11	58
Developing SAE opportunities for students	4	40	8	42
Supervising SAE programs	4	40	7	37
Preparing for Career Development Events	4	40	6	32
Supervising CO-OP/Internships	2	20	5	26
Supervising show animal SAE projects	1	10	4	21

Note. Standard deviation in parenthesis next to mean value. Scale: 1 = no need, 2 = some, 3 = moderate, 4 = strong 5 = very strong. Frequency determined by number of beginning agriscience teachers indicating "very strong" inservice needs.

Instruction and Curriculum

The grand mean for traditionally certified agriscience teachers for instruction and curriculum inservice needs was 2.32 (*SD* = 1.01); while alternatively certified agriscience teachers had a grand mean of 2.36 (SD = 1.11). An independent sample t-test was utilized to examine if differences between grand means existed between these two groups; there was no significant difference ($t = 0.15$, $p = .88$). Similar to the findings in the professional development construct, many traditionally certified teachers did not indicate a high need for inservice training in instruction and curriculum. Specifically, these teachers indicated no need for inservice in integrating math into agriculture instruction, understanding learning styles, teaching leadership, developing a magnet program or academy, or integrating science into agriculture instruction.

On the other hand, the alternatively certified teachers did indicate a higher inservice need on specific items within this construct. Ten (53%) indicated a high need for inservice training to develop teaching techniques and ideas to motivate students. Alternatively certified teachers also requested more inservice training (42%) in testing and assessing student performance than their traditionally certified counterparts (10%). A noticeable difference was also found on the item, motivating students. Also, one (10%) of the traditionally certified teachers indicated a high need for training, where as 58% of alternatively certified teachers indicated a high need. However, like their traditionally certified counterparts, these teachers also indicated that assistance was not needed in integrating science into the curriculum. Table 5 presents additional findings regarding instruction and curriculum inservice needs for these beginning Louisiana agriscience teachers.

Table 5
Teachers with High Needs in Instruction and Curriculum by Certification Model

	Traditional (n = 10)		Alternative (n = 19)	
	M = 2.32 (1.01)		M = 2.36 (1.11)	
Item	f	%	f	%
Teaching SAE in the classroom	4	40	5	26
Changing the curriculum to meet changes in technology	3	30	2	11
Designing programs for non-traditional & urban students	2	20	3	16
Planning and effective use of block scheduling	2	20	2	11
Motivating students – teaching techniques and ideas	1	10	10	53
Testing and assessing student performance	1	10	8	42
Managing student behavior	1	10	5	26
Modifying lessons for special needs and ESL students	1	10	4	21
Modifying curriculum and courses to attract high quality students	1	10	3	16
Teaching in laboratory settings	1	10	3	16
Developing critical thinking skills in your students	1	10	2	11
Integrating state standards into the curriculum	1	10	2	11
Teaching problem-solving and decision making skills	1	10	2	11
Using computer technology and computer applications	1	10	1	5
Integrating math into agriculture instruction	0	0	4	21
Understanding learning styles	0	0	3	16
Teaching leadership	0	0	2	11
Developing a magnet program or academy	0	0	1	5
Integrating science into agriculture instruction	0	0	0	0

Note. Standard deviation in parenthesis next to mean value. Scale: 1 = no need, 2 = some, 3 = moderate, 4 = strong 5 = very strong. Frequency determined by number of beginning agriscience teachers indicating "very strong" inservice needs.

Technical Agriculture

The grand mean for traditionally certified agriculture teachers for this construct was 2.79 (*SD* = 1.12). The majority of teachers indicated a high level of need for inservice training on electricity and controls (60%), global positioning systems (60%), aquaculture (50%), and small engine technology (50%). The grand mean for the alternatively certified teachers was 2.73 (*SD* = 1.21). These respondents did not indicate a high need for inservice in any area. Although interesting, this is not completely dissimilar from what Roberts and Dyer (2004) found in their study. Their research indicated that alternatively certified teachers had a high need for inservice training only in advances in biotechnology.

Grand mean differences between these traditionally and alternatively certified agriscience teachers were examined utilizing an independent sample t-test. No significant difference was found (t = -0.28, p = .78) between these groups regarding technical agriculture inservice needs. Nevertheless, differences were observed in several of the individual items. Traditionally certified teachers indicated more inservice training needs in large (40% versus 11%) and small project construction (40% versus 5%). Alternatively certified teachers indicated more inservice training needs in landscaping (32% versus 20%), forestry (32% versus 10%), greenhouse operation and management (26% versus 0%), and plant propagation (32% versus 0%). Table 6 provides more

information regarding findings of technical agriculture inservice needs.

Table 6
Teachers with High Needs in Technical Agriculture by Certification Method

	Traditional (n = 10)		Alternative (n = 19)	
	M = 2.79 (1.12)		M = 2.73 (1.21)	
Item	f	%	f	%
Electricity and Controls	6	40	8	42
Global Positioning Systems (GPS)	6	60	6	32
Small Engine Technology	5	50	7	37
Aquaculture	5	50	6	32
Genetic Engineering	4	40	6	32
Tissue Culture	4	40	6	32
Meat Science	4	40	5	26
Oxy-Acetylene Welding and Plasma Cutting	4	40	4	21
Ag Mechanics – Large Project Construction	4	40	2	11
Ag Mechanics – Small Project Construction	4	40	1	5
Floriculture	3	30	8	42
Advances in Biotechnology	3	30	5	26
Restricted Pesticide License Training	3	30	4	21
Tool and Machine Conditioning and Repair	3	30	2	11
Animal Reproduction – A.I. and Embryo Transfer	2	20	8	42
Plant Identification and Use	2	20	7	37
Landscaping	2	20	6	32
Waste Management	2	20	5	26
Food Science and Food Safety	2	20	4	21
Soil Science	2	20	3	16
Global Agriculture Issues	2	20	2	11
Forestry	1	10	6	32
Turfgrass	1	10	6	32
Water Quality/Water Regulations	1	10	5	26
Financial Management	1	10	4	21
Forages	1	10	4	21
Animal Health	1	10	3	16
Animal Nutrition	1	10	3	16
Natural Resource Management	1	10	3	16
Record Keeping Skills	1	10	3	16
Agricultural Sales and Marketing	1	10	2	11
Plant Propagation	0	0	6	32
Greenhouse Operation and Management	0	0	5	26

Note. Standard deviation in parenthesis next to mean value. Scale: 1 = no need, 2 = some, 3 = moderate, 4 = strong 5 = very strong. Frequency determined by number of beginning agriscience teachers indicating "very strong" inservice needs.

Conclusions, Discussion, and Implications

Because only beginning agriscience teachers in Louisiana were surveyed, findings were only applicable to this population. Based upon the research purpose and objectives of this study, several conclusions can be drawn. First, nearly two-thirds of the beginning teachers in this study received their certification by some means other than what is considered the traditional route. This is much larger than what Roberts and Dyer (2004), who found that 49% of agriculture teachers in Florida were alternatively certified. According to Camp et al. (2002) the national average is just over 13%. The increase in alternatively certified teachers does suggest a need to tailor induction programming to the needs of these individuals. However, if teacher educators believe traditionally prepared agriscience teachers are better prepared for the teaching profession, the question should not be how to provide better induction programs for alternatively certified teachers; rather the question should be how can teacher educators recruit more undergraduate students to teach agriculture?

The first objective of this study sought to describe the inservice needs of traditionally certified beginning teachers. The findings indicated that that these teachers have the highest level of inservice needs in the FFA and SAE and technical agriculture constructs, followed by program planning and management, instruction and curriculum, and professional development. It is interesting to note, that the order of importance is nearly opposite of the findings of Roberts and Dyer (2004). The greatest individual inservice need for beginning traditionally certified teachers was preparing proficiency award applications. Although this was noted as a high need in previous studies (Garton & Chung, 1996; Roberts & Dyer, 2004; Washburn et al. 2001), it was not identified as the most pressing need. State staff should begin providing induction programming for beginning agriscience teachers to improve their skills in helping students complete proficiency applications, and teaching SAE in the classroom as it relates to the Louisiana FFA record book.

The second objective was to describe the inservice needs of alternatively certified agriculture teachers. The findings indicated that the greatest inservice needs of this group were in the FFA and SAE supervision construct followed in decreasing order by technical agriculture, program planning and management, professional development, and instruction and curriculum constructs. Three individual items indicated the same level of importance, writing grant proposals for external funding, preparing proficiency award applications, and preparing FFA degree applications. Roberts and Dyer (2004) also found that inservice training in writing grant proposals was of high importance, the latter were new findings. State staff in Louisiana should provide beginning alternatively certified agriscience teachers with instruction concerning how to improve their skills in helping students complete proficiency applications, and FFA degree applications in relation to the Louisiana FFA record book. The authors suggest that because writing grant proposals for external funding was not determined to be a competency related to quality teaching in agricultural education, that inservice regarding this competency be deferred to a later time.

The third objective of this study was to compare the differences in inservice needs between the two groups of teachers. Based upon the findings of this study, beginning alternatively certified teachers have no significant difference of inservice needs than beginning traditionally certified teachers when comparing overall competencies of program planning and management, professional development, and instruction and curriculum. Based on this finding, state staff in Louisiana should not feel compelled to offer different induction programs for

alternatively and traditionally certified agriscience teachers. When examining specific items, over 50% of alternatively certified teachers indicated high inservice needs on only five items. Over 50% of traditionally certified teachers indicated high needs on eight items. Although Roberts and Dyer (2004) did not specifically target beginning teachers, these conclusions were strikingly different than what they reported for agriscience teachers in Florida.

It is interesting to note that grand means of these inservice constructs were comparatively lower than the study conducted by Roberts and Dyer (2004). However, agriscience teachers in Louisiana did not provide any additional inservice needs when prompted in the survey. At the time of administering the survey, it was the intentions of state staff to begin induction and inservice programs for agriscience teachers. Minimal induction programming was offered to beginning agriscience teachers in Louisiana prior to this study. It may be possible that these beginning agriscience teachers were subject to the Hawthorne effect (Adair, 1984), whereas lower grand mean scores of inservice needs indicated a higher level of competency. This may especially be true for the professional development inservice needs measured by the survey.

The results of this study generate nearly as many questions as answers. Do the beginning agriculture teachers in this study simply lack the professional knowledge to identify their deficiencies? Why do the inservice needs of beginning teachers in this study differ so greatly than agriculture teachers in Florida? Were the study participants who were graduates of post-secondary agricultural education programs being prepared in such a fashion that little additional assistance is needed? Were there really any significant differences between traditionally and alternatively certified teachers? Were the differences that exist between the findings of this study and that of Roberts and Dyer (2004) related to geographic location, cultural beliefs and ideals, or some other unidentified phenomenon? It is recommended that these questions be used as a guide for future research.

Although few inservice needs were indicated by the study participants it is still recommended that an induction program for these teachers be developed to assist them with their self-perceived needs. Participating in such a program may assist the beginning teachers in identifying additional needs that they may have been unaware of, as a result of idea sharing between other beginning teachers. Furthermore, utilizing findings and data from similar studies in other states is beneficial when attempting to develop needs assessments or inservice programs. The National Research Agenda (Osborne, n.d.) noted that professional development programs must be provided that account for the subtle differences that may exist between teachers based on geographic locale. This supports the authors' recommendation that this study to be completed in other states so that university faculty and state staff can identify and address the needs of agriculture teachers in their own state.

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THE IMPACT OF ORGANIZATIONAL SOURCE CREDIBILITY AND THE FACTORS THAT CONTRIBUTE TO OPINION LEADERS' DECISIONS TO DIFFUSE INFORMATION

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Abstract

This study examined source credibility of Florida's agricultural organizations as viewed by state agricultural opinion leaders. In addition, this study sought to determine the amount of information that opinion leaders receive from agriculture organizations, as well as identify factors that contribute to an opinion leader disseminating an organization's message. The population consisted of the alumni of a leadership program targeted towards adult agricultural leaders (N=163). Ninety-four alumni responded, giving the survey a 57.7% response rate. This study found that opinion leaders receive and find most credible the information that comes from the organization in which they are most involved. Also, results indicated that the factor that was most likely to cause an opinion leader to disseminate an organizational message was "the organization presents evidence to support its message." Opinion leaders were least likely to disseminate information from organizations when "the organization's intent is questionable."

Introduction

The agricultural industry is a vital part of Florida's economy. The agricultural industry ranks second in Florida's overall economy (Woods, 2008). Within Florida, there are 280 commodities produced (Florida Department of Agriculture and Consumer Services, 2007) that were credited with $137 billion in sales revenue in 2007 (Woods, 2008). Not only does the agricultural industry produce important revenue, but the industry also provides jobs that are essential for the stability of the state's economy. Woods (2008) stated, "Agriculture, natural resources, and related industries provide direct employment of 1.5 million people in full-time and part-time jobs" (¶ 15). This significant number of jobs equates to approximately 14.2 percent of all jobs in Florida are dependent upon the agriculture industry (Woods, 2008).

With Florida's agriculture industry supporting 1.5 million jobs (Woods, 2008), it is vital that the individuals who depend on the agriculture industry to support their livelihoods receive credible information from industry leaders and organizations. Receiving credible information about the important issues in agriculture ensures that these individuals are able to make informed decisions regarding their livelihoods. However, because of the sizeable number of commodities produced in the state, there are a myriad of information sources available to agricultural leaders seeking to be informed on important agricultural issues. Yet, not all of the information sources are congruent with the information that they provide about specific issues, leaving those individuals within the agricultural industry to decide which information is credible and can be trusted.

A specific example of this message incongruence was seen when Parker and Farmer (2008) claimed in *Farm and Ranch News*, an online publication targeted towards individuals involved in the state's agriculture industry, that University of Florida President Bernie Machen said, "Agriculture is a dying industry in the state" and "not worthy of the investments being made by the legislature" (¶ 2). The alleged statement was made in reference to the impending budget cuts that were to be made by the university. Although Machen denied this accusation in a personal statement, agricultural leaders and their constituents continued to remind the president that agriculture was, indeed, not dying.

Bouffard (2008) quoted Doug Bournique, executive director of Indian River Citrus League as stating, "[Machen's] getting a full-frontal attack from agriculture saying we are important," and that "the word's getting very strongly back to the University of Florida that agriculture is very important to this state - it's the backbone" (¶ 4). In addition, Bouffard (2008) also reported that within hours of the *Farm & Ranch News* article, more than 60 agricultural leaders from throughout the state participated in a conference call to address Machen's alleged comments.

While this is only one example, it sets the stage for understanding the importance of identifying sources of information agricultural industry leaders find the most credible and from which sources they base their decision making. One must question why industry leaders appear to trust and give credence to an anonymous source in an online publication more than the fervent personal denial by a university president. What qualities existed within the online publication that caused such believability in the article? Likewise, what qualities caused his denial to go slightly unnoticed and largely distrusted? The answer to these questions and others similar in

nature might be found by understanding how agricultural opinion leaders perceive information from industry organizations and discovering which organizational sources are regarded as credible enough for opinion leaders to diffuse the organization's information. This study focused on the perceived credibility of selected state-wide agricultural organizations as viewed by Florida's agricultural opinion leaders.

Theoretical Framework

The foundational theoretical principles in this study included the two-step flow model of communication and source credibility theory. Historically, opinion leaders have been recognized as an important link in the diffusion of messages to the general public. Lazarsfeld, Berelson, and Gaudet (1948) conceptualized the diffusion of messages in a two-step flow model of communication. This model first highlighted opinion leaders as an important step in the diffusion of communication messages. The two-step leaders then pass the information along to individuals within the public (Weiman, 1982). Other studies have elaborated the original two-step flow model to include other steps in the dissemination of information, but the importance of opinion leaders and interpersonal influence continue to remain an important part in linking mass communication to the public.

Researchers have also analyzed the credibility, trustworthiness, and overall attitude towards communicators (Hovland & Weiss, 1954; Kelman & Eagly, 1965; Sternthal, Phillips, & Dholakia, 1978). These studies have been conclusive in reporting that credibility, trustworthiness, and overall attitude towards communicators play important roles in determining how the messages are perceived and accepted by the public.

An initial review of the literature indicates there is a gap in research, which includes studies analyzing agricultural organizations as sources of information and how opinion leaders utilize these organizations to gain information. Currently, little research has been done on organizational and corporate firms as sources of information (Newell & Goldsmith, 2001). Newell and Goldsmith (2001) defined corporate credibility, in part, as "the extent to which consumers feel that the firm has the knowledge…to fulfill its claims and whether the firm can be trusted to tell the truth or not" (p. 235).

This study examined opinion leaders' perceptions of organizational credibility because as Flynn, Goldsmith, and Eastman (1996) explained, "consumers tend to trust the opinions of others more than they do formal marketer-dominated sources of information, such as advertising, and they use interpersonal sources to reduce risk and to make both store and brand choices" (p. 137). Moreover, Scheufele and Shah (2000) found "opinion leaders, like individuals with personality strength, are thought to shape their fellow citizens' reactions to social issues" (p. 109).

Therefore, one could deduce that opinion leaders' acceptance of an agricultural organization as credible has a major impact on the acceptance of the organization as credible by the general public. Relating this statement to the agriculture industry, one could hypothesize that the amount of credibility given to an organization by agricultural opinion leaders directly affects the credibility that others involved in the industry give that same organization.

Purpose/Objectives

The purpose of this study was to examine the perceived source credibility of Florida's agricultural organizations as viewed by the state's agricultural opinion leaders. In addition, this study sought to determine the amount of information that opinion leaders receive from agriculture organizations, as well as identify factors that contribute to an opinion leader disseminating an organization's message.

The following research objectives were used to guide this investigation:

Objective 1: To determine the amount of information that agriculture opinion leaders receive from selected state-wide agriculture organizations.

Objective 2: To determine the perceptions of source credibility of selected organizations in agriculture utilized by state opinion leaders.

Objective 3: To determine the factors that influence whether an opinion leader will disseminate an organizational message to the general public.

Limitations

The first limitation is that the study was not based on a random sample, but rather a purposive sample. The study was purposive because the individuals participating in the leadership program studied are distinct representatives of agriculture opinion leaders located throughout Florida. The Wedgworth Leadership Institute for Agriculture and Natural Resources (WLIANR) participants are the individuals that comprised this purposive sample. Ary, Jacobs, Razavieh, and Sorenso (2006) noted that one of the pitfalls to using a purposive sample is that "there is no reason to assume that the units judged to be typical of the population will continue to be typical over a period of time" resulting in the possibility of purposive studies being misleading (p. 174).

Additionally, a second limitation for this study is that the WLIANR is based at the University of Florida and therefore participants are also affiliated with the university. Lastly, a third limitation is that the data in this study were self-reported. Self- reported scores are a limitation because it is possible that participants may not answer the questionnaire truthfully, thus obtaining inaccurate results in the study. Ary, Jacobs, Razavieh, and Sorenso (2006) asserted that self-reported instruments' validity "depends in part on the respondents' being able to read and understand the items, their understanding of themselves, and especially their willingness to give frank and honest answers" (p. 225).

Methods

The research design was a quantitative study that utilized descriptive census survey methodology. More specifically, since this study examined the opinions and perceptions of credibility, it can be classified as a census survey of intangibles. The term "intangible" refers to constructs such as attitudes, values, opinions and other personal characteristics that are often difficult to measure (Ary, Jacobs, Razavieh, & Sorensen, 2006). In this study, the population of interest consisted of the state's agriculture opinion leaders.

The sampling frame used in this study included alumni members of the Wedgworth Leadership Institute for Agriculture and Natural Resources (WLIANR). This program began in 1989, has graduated seven classes, has approximately 175 alumni members, and targets adult agricultural leaders (Wedgworth Leadership Institute for Agriculture and Natural Resources, 2010). This sampling frame (N=163) was selected for study because as alumni of the leadership program, they are recognized as leaders in the state's agriculture industry. Additionally, these individuals represent a cross-section of the commodity industries within the state giving the study a broader perspective.

Prior to the collection of data from the alumni members, a pilot test was conducted. The pilot study included 29 current participants in WLIANR. Upon receiving the data of the pilot study, the researcher conducted a Cronbach's alpha test and determined the reliability of the credibility construct to be a coefficient of 0.94. According to the literature, an alpha coefficient of 0.70 has shown to be an acceptable reliability coefficient (Nunnaly, 1978, as cited by Santos, 1999). Once the pilot data were collected, the panel of experts reviewed the data for validity and reliability. Following the review by the panel of experts and in conjunction with participant feedback, the researcher modified the instrument to more accurately assess the population. The instrument was expanded to include specific questions relating to factors that impact message dissemination, as well as a series of personality questions. Following the revision, a second pilot test was conducted.

The second pilot test was sent electronically to 10 current participants in the leadership program. In order to test the reliability of the newly added survey instrument questions, a Cronbach's alpha test was conducted. The results from this test showed that the reliability of the section measuring factors that impact message dissemination was an alpha coefficient of 0.98. Moreover, Cronbach's alpha measured reliability of the personality section at a coefficient of 0.86.

In order to gather data from the sampling frame, a Web survey was utilized. Dillman (2006) suggested that Web surveys offered a great deal of potential for very little cost. The researcher found no existing instrument that measured the source credibility of agricultural organizations; therefore, the researcher created the instrument. After consulting with a panel of experts, the following organizations were selected to be a part of this study: Florida Department of Agriculture and consumer Services (FDACS), Florida Farm Bureau Federation (FFBF), University of Florida/Institute of Food and Agricultural Sciences (UF/IFAS), all Florida agricultural organizations as a whole, and one specific organization that was selected by the study respondent.

The first part of the questionnaire required the respondents to answer questions regarding how much of their information they receive from the FDACS, FFBF, UF/IFAS, and all other statewide agricultural organizations, as well as the organization in which they are most involved. The questionnaire then allowed for the respondents to write in the organization in which they are most involved.

Then the respondents were assessed regarding their perceived credibility of organizations by responding to 11 unique constructs that measured the trustworthiness and the expertise of each organization. Once each organization's perceived credibility was measured, a credibility index was created in order to rank the credibility of the organizations used in the study. The third part of the survey questioned respondents regarding 26 factors that could potentially affect whether a message from an organization would be distributed via opinion leaders. Demographic data were collected from the respondents.

Results

Of the 163 participants in the sampling frame, 94 responded giving the study a 57.7% response rate. The non-response error was accounted for by comparing the early to the late responders. Ary et al. (2006) asserted that non-respondents are often similar to late respondents; meaning that by examining the responses of non-responders, the researcher should be able to estimate the responses of late respondents.

The WLIANR alumni were analyzed by the following demographics: age, gender, education level, leadership position held, length of leadership position, and race. Of the respondents, 64.9% (*n*=61) were male, 21.3% (*n*=20) were female, and 13.8% (*n*=13) did not respond. In the age category 7.4% (*n*=7) reported being 25-35 years old; 26.6% (*n*= 25) reported being 36-45 years old; 40.4% (*n*= 38) reported being 46-55 years old; and, 12.8% (*n*= 12) reported being 55 years old or older.

In regard to the respondents' educational background, 3.2% (*n*=3) described their highest level of education to be high school graduate or GED recipient; 8.5% (*n*=8) had some college but did not receive a degree; 1.1% (*n*=1) indicated their highest level of education was an associate's degree; 53.2% (*n*= 50) received a bachelor's degree; and, 21.3% (*n*=20) received a graduate level or professional degree.

Additionally, 76.6% (*n*=71) of the respondents reported to have held a leadership position in the agriculture industry. Of the 71 respondents who reported having held a leadership position, 14.1% (*n*=10) served in that position for 1-2 years; 8.5% (*n*=6) served in a leadership position for 2-3 years; 11.3% (*n*=8) served in a leadership position for 3-4 years; 9.9% (*n*=7) served in a leadership position for 4-5 years: and, 56.3% (*n*=40) served in a leadership position for 5-6 years.

Objective one sought to determine the amount of information that opinion leaders receive from each organization in the study. This objective had a range possibility of one to five with one equaling "none at all" and five equaling "a great deal" (Table 1). Of the five organizational categories, the organization in which the respondent was most involved had the highest mean score (*M*= 4.18, *SD*=0.977) and FDACS received the lowest score (*M*=2.62, *SD*= 0.986).

Table 1. Opinion Leaders Information Reception from Agricultural Organizations Mean Scores

	M	*SD*
Organization Most Involved	4.18	0.977
UF/IFAS	3.67	0.968
Other State Organizations	3.22	1.212
FFBF	3.01	1.282
FDACS	2.62	0.986

Objective two sought to determine the perceptions of source credibility of selected organizations in the state's agriculture industry that are utilized by opinion leaders. Following the gathering of information regarding how much information leaders receive from each of the organizations in the study, opinion leaders measured each organization in credibility constructs. These constructs included sincerity, honesty, trustworthiness, dependability, reliability, knowledge, experience, qualifications, skills, expertness, balance. Once the 11 individual constructs were measured for each organization, a credibility index was created for each of the organizations in order to secure a credibility mean for each organization (Table 2). The credibility index was created by calculating the combined mean scores for the 11 credibility constructs. The organization that received the highest credibility index score was the organization that the respondent was most involved (*M*=4.27, *SD*=0.732). The organization receiving the lowest credibility index score was the collective all other state organizations not listed in the survey (*M*=3.50, *SD*=0.852)

Table 2. Credibility Index of Agricultural Organizations

	M	*SD*
Organization Most Involved	4.27	0.732
UF/IFAS	4.12	0.657
FFBF	3.94	0.815
FDACS	3.68	0.802
Other State Organizations	3.50	0.852

Objective three measured 26 factors believed to influence whether messages from agricultural organizations were disseminated from opinion leaders down to the general public. These factors were based on input from the pilot test groups, the panel of experts, and the literature. The range scale scores were 1-5 with labels indicating that 1=disagree, 3=somewhat agree, and 5=agree. The factor that received the highest mean score indicating a strong tendency to pass along the information was "The organization presents evidence to support its message" (*M*=4.55, *SD*=0.610*)*. The factor that received the lowest mean score indicating a weaker

tendency to pass along the information was “The organization’s intent is questionable” (*M*=2.01, *SD*=1.174). Table 3 exhibits the factors, frequencies, means, and standard deviations of the 26 factors used in the study.

Table 3. Factors that Influenced Information Dissemination by Opinion Leaders (n=79)

Information Dissemination Factor	*M*	*SD*
The organization presents evidence to support its message.	4.55	0.61
I understand the organization's stance on the issue.	4.53	0.63
The issue affects my livelihood.	4.49	0.78
The issue has large financial implications.	4.34	0.77
I feel a sense of responsibility to others to pass along the information.	4.29	0.77
The organization has a logical association with the issue.	4.28	0.79
The organization is familiar to me.	4.27	0.82
The organization appears to be well-managed.	4.17	0.85
I have personal time to relay the information.	4.14	0.93
I personally know others within the organization.	4.11	0.96
The issue affects a large number of people	4.07	0.87
Based on my past interactions with the organization, I have positive feelings toward the organization.	4.05	1.04
I am a member of the organization.	3.98	1.09
The organization has a vested interest in the issue.	3.90	0.89
I perceive personal benefits based on the organization's information.	3.82	1.10
I agree with the organization's stance on the issue.	3.78	1.29
The issue evokes a personal emotional response.	3.41	1.18
I perceive personal detrimental consequences based on the organization's information.	3.30	1.44
I perceive detrimental consequences for others based on the organization's information.	3.30	1.35
The issue is controversial in nature.	3.12	0.98
The organization's information is new to me.	3.08	1.07
The organization's information conflicts with previous information that I've heard.	2.83	1.16
The issue is against my personal values/beliefs.	2.55	1.42
The organization appears to be motivated by profit.	2.22	1.04
Based on my past interactions with the organization, I have negative feelings toward the organization.	2.22	1.12
The organization's intent is questionable.	2.01	1.17

Implications/Conclusions

There has been little research done that has examined the organization as a source of information (Newell & Goldsmith, 2001). However, corporate and organizational credibility has remained an important research avenue. Healy (2005) quoted Project for Excellence in Journalism director Tom Rosenstield as stating "the best each organization can do is try to improve its own credibility." This study has implications for the theory of source credibility as the results from this study indicate support for Berlo, Lemert, and Mertz's (1970) study that suggested ,"an individual's acceptance of information and ideas is based in part on 'who said it'" (p. 563). This study sought to understand the perceived credibility of a few agricultural organizations in the state of Florida in order to lay the groundwork for studying agricultural organizational credibility. By understanding the basic components of credibility the work may begin on actually improving each organization's credibility.

This study found that opinion leaders receive the majority of their information from the organization in which they are involved the most. Following the organization in which they are most involved, Florida's agricultural opinion leaders sought information from an educational entity, such as UF/IFAS, one of the state's land-grant institutions. In this study, it was found that only after opinion leaders received information from their organization of involvement and UF/IFAS, did they get information from other state agricultural organizations in which they were not a member. Therefore, in order to successfully distribute a message, it would appear that an organization will have the most success by creating "buy-in" for their own membership before trying to expand the message to reach others in the industry. Agriculture organizations should allocate time and resources to educating internal organizational opinion leaders as those opinion leaders are seeking information from organizations in which they are a member before looking at other information sources.

This study's credibility index indicated that not only did the study participants receive the majority of their information from the organization that they were most involved, but they also found the organization in which that they were most involved more credible than any other organization listed in the study. Following the organization in which they were most involved, respondents listed the state's land-grant university as being the second-most credible organization in the study. When analyzing the individual credibility constructs, the construct that rated the highest, in regard to the "organization the respondent was most involved" was "trustworthiness," while the respondents rated UF/IFAS's highest construct as being "knowledgeable." This finding can be linked back to Lui and Standing's (1989) finding that when sources are compared based on trustworthiness and expertise, individuals will find the source they deem as trustworthy more credible than one they deem as being an expert. The same finding was true in this study. Respondents found the organization they trusted the most as being more credible than the expert source.

Based on this finding, organizations should work to build trustworthiness with both external and internal audiences. In this study, opinion leaders tend to find organizations that they feel they can trust as more credible than organizations they feel are experts. One way that the organizations can build trustworthiness with the public is to demonstrate to the public that the organization has a vested interest in the issue being communicated. Haley (1996) noted

"messages received from a business with a vested interest in the public issue were rated significantly more believable and credible than messages sponsored by a business without an apparent vested interest in the issue" (p. 23).

Moreover, Sternthal, Phillips, and Dholakia (1978) asserted that the organization deemed as highly credible is able to extract greater advocacy support; therefore, the organizations that opinion leaders are most involved in should be the some of the largest advocacy groups in the state. The organization that respondents listed as being most involved in was a state association whose Web site claims to be "leading voice of Florida's agriculture." In order to effectively distribute a credible message, organizations should focus on communicating the message to internal opinion leaders, and build trustworthiness among those leaders. Once those steps are highly functioning, the organization is positioned to extract advocacy support from those leaders to disseminate the message to external audiences.

After analyzing all of the organizational credibility constructs, the construct "balanced" was consistently rated as lowest for all five organizations. However, the construct "honest" was rated as one of the two highest means for all organizations except UF/IFAS. Therefore, opinion leaders appear to believe that even if organizations lack balance in their information, the organization can still be regarded as relatively honest. This perception of lack of balanced information could be linked back to Rogers (2003) who noted that opinion leaders tend to be more exposed to external media and communication efforts. It appears that because opinion leaders are more aware of the presence of external media and realize that the industry tends to talk to itself, they feel the information from industry organizations is unbalanced. However, while they may feel the information from within the industry is un-balanced, they feel the industry sources are disseminating the honest information.

In regards to the 26 factors that determine if an opinion leader will diffuse a message from an organization, the factor that received the highest mean score was "the organization presents evidence to support its message." But, secondly opinion leaders must also "understand the organization's stance on the issue." In a study on shaping public opinion, Page, Shapiro and Dempsey (1987) included "the information must be understood by recipients" as one of the top five features that must be present in order to have an impact on public opinion. It is vitally important that when an organization is attempting to disseminate a message that opinion leaders are easily able to identify and understand the evidence that supports the message. Ruth's (2005) study revealed that the agriculture "industry tends to talk to itself…and ignore[s] …non-agricultural publics" (p.111). This self-talk could be detrimental to agricultural organizations if it is not understood by opinion leaders. Agricultural organizations must disseminate messages and support evidence in language that is easily understandable to opinion leaders and resonates with them.

Additionally, a factor that was used in this study that supported past literature was if the opinion leaders personally knew others in the organization. In this study, knowing others in the organization indicated a strong tendency to pass along the information from the organization. Rogers (2003) reported opinion leaders as being "at the center of interpersonal communication networks" (p. 27). Similarly, Beckman (1967) noted that an "aspect that has been… reinforced…

is that interpersonal relationships between opinion leaders and others… influenced decisions" (p. 37). Therefore, it would be in an agricultural organization's best interest to provide opportunities for opinion leaders to network around their organization. Some specific examples include allowing an employee to participate in a WLIANR-type program so that other opinion leaders can "put a face with the agriculture organization," or hosting social events for the benefit of multiple agriculture organizations.

Recommendations

Since the constructs of organizational credibility used in this study were limited to the panel of experts, literature, and a pilot study, a qualitative study should be done with opinion leaders to uncover any additional factors that could add to the overall perceptions of organizational credibility and were not used in this study. Research should also be done to investigate how opinion leader personality type influences organizational credibility assessment as personality type could affect opinion leadership and message distribution. Moreover, research should assess the best method for increasing organizational credibility among introverts and extroverts.

Additionally, research should be done to determine if different types of organizations have different credibility expectations. For example, do opinion leaders value some credibility constructs more than others depending upon the organization disseminating the message (universities v. government agencies)? Finally, research should be done that explores whether the communication channel (i.e Internet, print, face-to-face) affects the organization's credibility.

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A Content Analysis of Teen 4-H Member Responses in Relation to the Factors that Affect Their Involvement in Pennsylvania 4-H Programming

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Abstract

Studies have shown that teenage 4-H member retention lies within the context of the program offerings (Lauver & Little, 2005; Ritchie & Resler, 1993). In this study a content analysis was completed on data collected from apriori open-ended questions from a larger study. The questions were designed to provide rich data on 4-H members' personal accounts of their experiences within 4-H. The researcher classified opportunities for participation into three categories (based on the questions): most memorable 4-H experience, opportunities to plan 4-H events, and factors that would encourage increased participation and emergent themes were identified. Following the content analysis of the responses included in the most memorable 4-H experience, four different themes emerged: events, friends and meeting new people, recognition, and club activities. The analysis of the responses in relation to opportunities to plan 4-H events yielded three common themes: planning club activities, planning county and regional 4-H events, and never planned an event. Finally, when asked to describe what would encourage them to participate more often in 4-H events/activities at the county, regional and state levels, the analysis of the participants' responses were analyzed and resulted in three common themes: friends and the opportunity to meet new people, more available resources (i.e. money, time, and transportation), and more information provided on the events.

Introduction and Framework

Throughout history, community programs such as 4-H, Boy Scouts, Girl Scouts, the Boys and Girls Clubs of America, and the YMCA have promoted youth development by providing a safe environment where young people of all ages can explore personal interests and develop peer groups that share those same interests (Anderson-Butcher, Newsome, & Ferrari, 2003; Cano & Bankston, 1992; Ferrari & Turner, 2006; Lauver & Little 2005; Weber & McCullers, 1986; Weiss, Little, & Bouffard; 2005; Wingenbach, Nestor, Lawrence, Gartin, Woloshuk, & Mulkeen, 2000). Community programs provide youth with various learning opportunities in order to acquire the skills needed so that they can make plans, overcome obstacles, and achieve desired ends (Larson, 2000). Dworkin, Larson, and Hansen (2003) reported, "…youth activities such as sports, arts groups, and organizations" (p. 25) provide learning opportunities that encourage members to be "…agents of their own development" (p. 25). The learning opportunities (i.e. goal setting workshops, structured planned practices, teamwork activities, leadership roles) allow members to improve time management skills, conduct business with adults, and improve their public speaking, confidence, and teamwork skills (Dworkin et al., 2003).

Pennsylvania 4-H members are provided learning opportunities through participation in 4-H projects. The project curriculum areas offered through Pennsylvania 4-H are: *animal science, citizenship and civic education, communication and expressive arts, environmental and earth sciences, family and consumer science, healthy lifestyles education, intergenerational programming, leadership and personal development,* and *science and technology* (Pennsylvania 4-H, n.d.). Pennsylvania 4-H also provides additional learning opportunities to members through various activities and events: *State Leadership Conference, Capitol Days, State 4-H Achievement Days, County Ambassador Program,* and *State Council.*

Membership recruitment and retention are challenges faced in 4-H, particularly when referring to older youth (Harder, Lamm, Lamm, Rose, & Rask, 2005). Between 2001 and 2007, Pennsylvania 4-H has experienced a decline in overall membership. Membership in 2001 exceeded 123,000 which dropped to under 93,000 by 2007 (Pennsylvania 4-H, 2007). All membership statistics exclude cloverbud members. Even though an overall decline in membership was evident across age groups, enrollment of 13-18 year old club members have been consistently lower since 2001 with a slight increase in membership in 2006-2007 (see Figure 1).

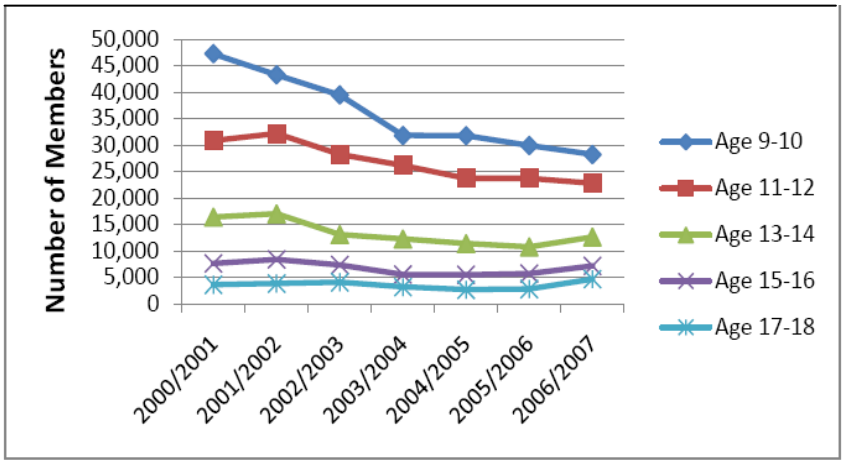

Figure 1. Pennsylvania 4-H Membership (Excluding Cloverbuds) from 2001-2007.
Source: Youth Development Annual Report, Pennsylvania 4-H. (http://pa4h.cas.psu.edu)

In the context of 4-H participation, youth involved in 4-H are presented with various opportunities and activities to participate. Research advocates that recruitment and retention programs geared towards teenagers are needed in 4-H and other youth programs (Anderson-Butcher, Newsome, & Ferrari, 2003; Ferrari & Turner, 2006; Huebner & Mancini, 2003; Lauver, Little, & Weiss, 2004; Lock & Costello, 2001). Teens can serve as an important resource by providing valuable educational experiences for younger members (Ponzio, Junge, Smith, Manglallan, & Peterson, 2000). Thus, retaining older members strengthens their skills, while enhancing the learning experiences of younger members and reducing the workload of volunteers (Cantrell, Heinsohn, & Doebler, 1989).

Studies have shown teenage 4-H member retention lies within the context of the program offerings (Lauver & Little, 2005; Ritchie & Resler, 1993). If 4-H programs appear to be of low quality and do not meet the needs of teens, then teens will look elsewhere to fulfill those needs (Acosta & Holt, 1991; Ferrari & Turner, 2006; Harder et al., 2005; Lauver & Little, 2005; Radhakrishna, Leite, & Hoy, 2003; Ritchie & Resler, 1993). According to Acosta and Holt (1991), "designing programs to meet felt needs of clientele is definitely the key to maintaining involvement…" (p. 4). Additionally, overall program quality plays a key role in retaining members in youth community programs (Acosta & Holt, 1991; Ferrari & Turner, 2006; Harder et al., 2005; Lauver & Little, 2005; Radhakrishna et al., 2003; Ritchie & Resler, 1993).

A conceptual framework based on McClelland's motivational needs theory (McClelland, 1987), links the opportunities available to 4-H members to factors affecting member retention (see Figure 2). McClelland's theory consists of three motivational factors: a need for achievement, a need for affiliation, and a need for power (Rohs & Anderson, 2001). According to the conceptual framework, the need for achievement can be met through the projects members complete and the goals they reach. The completion of projects and goals are recognized in various forms through 4-H; money, prizes, or awards. The need for affiliation can be met through the relationships made with friends, parents, siblings, and 4-H leaders. Leadership roles such as serving as a committee chair, mentoring a younger 4-H member, serving as a teen leader, serving as a club officer, or being a member of the state 4-H council are offered to 4-H members and

assist in meeting the need for power (see Figure 2). The opportunities and factors that are noted in the conceptual framework play a key role in the overall quality of a 4-H program.

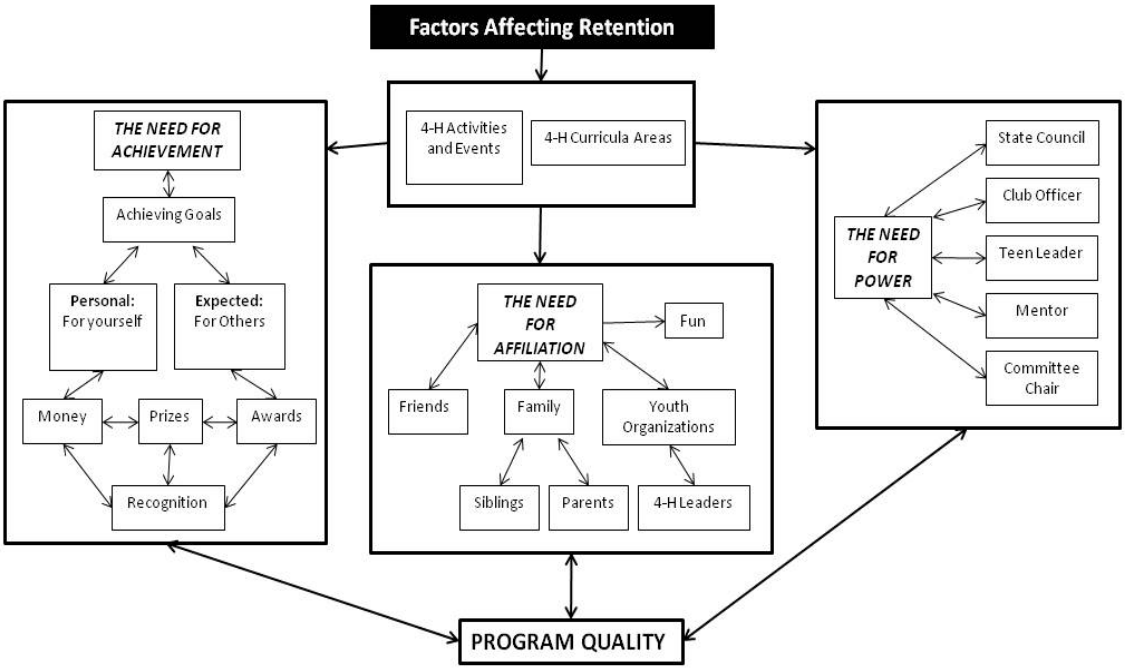

Figure 2. Conceptual Framework of Factors Affecting Retention, Based on McClelland's Motivational Needs Theory.

The Need for Achievement: Members with a high need for achievement do not like tasks that are too easy or too hard (McClelland, 1987). Individuals with a high need for achievement "are goal oriented and set moderate, realistic, attainable goals" (Lussier & Achua, 2001, p. 42). Research shows teens enjoy achieving goals, whether these goals are set personally or by others (Dworkin et al., 2003). Achieving goals within the 4-H program can result in recognition in the forms of verbal praise, awards, prizes, and sometimes money (see Figure 2) (Pennsylvania 4-H, n.d.). By providing the aforementioned opportunities for recognition and goal achievement, 4-H can better meet the needs of teens.

The Need for Affiliation: Individuals with a high need for affiliation seek close relationships with others, want to be liked by others, enjoy social activities, and seek a sense of belonging (Lussier & Achua, 2001). "Having a sense of belonging motivates young people to show respect and concern, as well as making them more receptive to guidance from other community members" (Hensley, Place, Jordan, & Israel, 2007, p. 3). Additionally, when youth feel valued and needed, the sense of belonging is increased and youth are more likely to remain involved in 4-H (Minnesota Extension Service, 1996). Ferrari and Turner (2006) reported continued participation in 4-H resulted from youth feeling comfortable and connected. According to McClelland (1987), individuals with a high need for affiliation have a tendency to

reflect upon relationships with others. Relationships within the 4-H program could involve friends, family members, or 4-H leaders (see Figure 2). Relationships made within 4-H must be positive and proactive towards the 4-H for members to remain involved (Wingenbach, Meighan, Lawrence, Gartin, & Woloshuk, 1999).

The Need for Power: Individuals with a high need for power are driven by influence and control (McClelland, 1987). McClelland recognized there are negative and positive aspects when considering power. The negative aspect arises when individuals are concerned with controlling or dominating a situation. When individuals exercise skills of persuasion or inspiration to help improve others, the positive aspect can be seen. The 4-H program focuses on the positive aspect of McClelland's theory by providing leadership opportunities for 4-H members. Specific leadership opportunities available to 4-H members include the chance to serve as a chair of a committee, mentor a younger 4-H member, be a teen leader, serve as a club officer, or serve as an officer of state 4-H council, (Pennsylvania 4-H, n.d.) (see Figure 2).

Motivation differs from one individual to another (Brennan, Barnett, & Baugh, 2007; Lock & Costello, 2001). McClelland's theory consists of three motivational factors: a need for achievement, a need for affiliation, and a need for power (Rohs & Anderson, 2001). Youth enjoy being part of a group and desire positive feedback when successfully completing tasks, large or small (Brennan et al., 2007). The need for achievement can be met through the goals members accomplish. By joining 4-H, youth have the opportunity to associate with a group of individuals with similar interests, thus fulfilling their need for affiliation. As cited in Dworkin, Larson, & Hansen, (2003), Brown (1990) stated, "When a teen joins a team, club, or activity group, other members often become part of that teen's peer friendship network" (p. 18). Leadership roles such as committee chair, mentoring a younger 4-H member, teen leader, club officer, or being a member of the state council are offered to members and assist in meeting the need for power.

Purpose and Objectives

The purpose of this study was to obtain a rich description of the factors that affect Pennsylvania teen 4-H member involvement within the 4-H program. To serve as a foundation for future retention initiatives, 4-H extension educators and adult volunteers need to know the factors that influence and encourage older 4-H members to remain engaged. To that end, the following objectives were established:

1. To identify memorable 4-H experiences that have impacted 4-H members' lives.

2. To identify opportunities available to 4-H members to assist in planning 4-H events/activities.

3. Determine factors that would encourage increased participation within the 4-H program.

Methods and Procedures

Remaining separate from the research context is impossible when conducting true qualitative research, to attempt to do so, would mean risking the opportunity to gain a great deal (Erlandson, Harris, Skipper, & Allen, 1993). So while the data may be "contaminated" by the human research instrument, those that do qualitative research understand that if appropriate standards of rigor are applied, this "contamination" only makes the study stronger (Erlandson, et.al, 1993).

Purposive sampling was used, in the case of this research, to seek out participants with very specific qualities: current members in good standing of a county 4-H program, over the age of 13, and willing to share 4-H experiences and general perceptions. Participants were identified using a roster of state 4-H leadership program participants. While Patton (1990) tells us there is no hard and fast rule for determining sample size in qualitative research, it is important to note that 87 young people participated in the study.

The word document can refer to a "written, visual, digital and physical material relevant to the study at hand" (Merriam, 2009, p.139). Documents do not intrude upon a situation the way that a human instrument might, nor are they dependent upon the ebbs and flows of human nature (Merriam, 2009). Berg (2001) tells us that private records are extremely useful when trying to understand how people make sense of their daily lives (p.200). In the case of this study, data collection used personal accounts of member experiences in the 4-H program, provided to the researcher as part of a larger study. These responses, by 87 young people, ages 13-18, representing each extension region of Pennsylvania, and a variety of programmatic areas, were the primary sources of data for the study.

At its heart, this is a true "basic" qualitative study (Merriam, 2009). Keeping that in mind, the researchers' most important goal was to gain a true understanding of how young people make sense of their experiences within the 4-H program. This idea is rooted in constructivist epistemology (Merriam, 2009). To analyze the data, researchers employed a latent content methodology. Berg (2001) describes latent analysis as analysis extended to interpretations of the symbolism underlying the data. In order to begin to make meaning of the data, researchers used open coding, allowing the team to "ask the data a specific and consistent set of questions, analyze the data minutely, frequently interrupt the coding to write theoretical notes, and never assume the relevance of traditional variables like age, race, gender, etc." (Berg, 2001 p. 251).

The measure of any research is the standards of rigor applied thereto. In the case of qualitative inquiry it is important to ask how researchers responded to questions of confirmability, transferability, dependability, and credibility. Credibility was established using peer debriefing consisting of an outside evaluation of the data analysis process and findings throughout the study, by individuals outside the immediate research context. To establish transferability researchers used thick description and purposive sampling. Remember, purposive sampling allows the researcher to study individuals or contexts that will provide rich and pertinent detail. Many misunderstand thick description, believing that great detail is needed in terms of contextual and participant description. However, Berg (2001) tells us that instead, thick description is a "sufficiently detailed descriptions of data in context and reports with sufficient detail and precision" (p.33). To establish dependability, an audit trail of codes to transcriptions

was maintained and methodological journaling was used to establish both dependability and confirmability.

Results

In the context of 4-H participation, youth were presented with questions inquiring about programmatic opportunities. The questions were developed based on previous research and were designed to provide a richer account of members' experiences. Three apriori open ended questions served as the categories for data classification; 1) most memorable 4-H experience, 2) opportunities to plan 4-H events, and 3) factors that would encourage increased participation.

Most Memorable 4-H Experience

The 4-H program offers members numerous events/activities at the club, county, regional, and state levels. The most memorable 4-H experiences category was designed to describe activities or events that have made a large impact on 4-H members' lives. Following the content analysis of the responses, four different themes emerged: events, friends and meeting new people, recognition, and club activities.

Events.

The 4-H mission statement reads, "4-H empowers youth to reach their full potential working and learning in partnership with caring adults" (Pennsylvania 4-H, n.d.). Fulfilling the mission statement of the 4-H program requires 4-H to offer quality opportunities for members to explore their interests and realize their full potential while interacting with adults and other 4-H members. State leadership conferences, 4-H camp, 4-H National Congress, regional retreats, and serving in leadership roles provide members with opportunities to improve their own skills and recognize their strengths and weaknesses. One member mentioned, their "…most memorable 4-H experience would have to be what happened this year at 4-H State Achievement days. It was not only fun, but I also learned a lot. I learned a lot about how to give a presentation from preparing for it, and I gained a lot of skills in presenting" (m.128). By recognizing their strengths and weaknesses, 4-H members can then choose activities that will utilize their strengths and manage their weaknesses. For example one member mentioned, "after I returned [from an exchange trip] I gave several speeches to organizations that aided me with donations and I got more comfortable with public speaking" (m.171).

Friends and meeting new people.

Involvement in fairs and shows provide an avenue for 4-H members to develop strong friendships while working together with other 4-H members to achieve a common task or goal. In regards to McClelland's motivational needs theory (1987), relationships within the club or organization can assist in fulfilling a person's need for affiliation (see Figure 2). Participating in club events allows 4-H members to stay connected to a familiar group and establish friendships close to home. In addition to club events, 4-H offers members numerous opportunities to participate in activities/events at the county, regional, and state levels. Attending

events/activities, above the club level, is a great way for 4-H members to interact with individuals from other parts of the county, region, and state and develop life skills that will benefit them in the future. Members mentioned serving as a "…camp counselor has been a great deal of fun..." and "…lifelong friends were made through [being a camp counselor]." Through the experience of being a camp counselor it was mentioned that "…responsibility and leadership skills were learned that wouldn't have been learned otherwise" (m.161). Not only do the members have the opportunity to interact with youth from other parts of the county, region, and state, but they also have the opportunity to develop many new friendships through those interactions. One student's most memorable moment was when he/she "…took a trip out to WI for the [subject specific] program; [He/she] met other teens from all over the country…" (m.171). One other member mentioned "when I went to 4-H camp and met a whole bunch of people…" (m.103), served as their most memorable 4-H experience. With over 90,000 4-H members on the Pennsylvania 4-H roster in 2007 (Pennsylvania 4-H, 2007), 4-H serves as an outlet for youth to meet many new people and make many new friendships that can last a lifetime. One member mentioned "[Regional Camp] was so much fun and I got to hang out with friends and got to know other people" (m.153). Numerous individuals mentioned they will always remember the friendships they made and the people they have met through 4-H, for example, "my most memorable 4-H experience was going to National Congress. It was nice to meet new people from around the United States" (m.160).

Recognition.

Many fairs and shows signify the completion of 4-H projects members have spent countless hours preparing or creating for several months. Recognition serves as a great retention tool for 4-H (see Figure 2) providing youth with opportunities to meet their needs for achievement as outlined by McClelland (1987). Members mentioned "…it was fun doing the projects and getting rewarded" (m.134). An example of this recognition is "…the state horse show when [the individual] was awarded the outstanding 4-H horse member award trunk at the awards ceremony" (m.106). Some 4-H members described events such as the state 4-H horse show, county fairs, and state farm show as their most memorable 4-H experiences. Experiences such as "…when I got fourth place with my goat in the market show at Farm Show" (m.141) and "going to the 4-H state horse show…with my miniature horse in driving" (m.107), are held as most memorable moments.

Club activities.

Club activities exhibit some of the highest participation rates of any 4-H events/activities and can affect youth involvement (Gill, Ewing, & Bruce, 2010). Several 4-H members shared their memories of being involved in club activities such as "doing a [subject specific] workshop for the public with my entomology club. [The workshop] was a lot of fun and we got to teach the public about insects" (m.143) and "when my club went to do a community service project at an older home" (m.114) as their most memorable 4-H experiences.

Opportunities to Plan 4-H Events

Pennsylvania 4-H members are given the opportunity to be involved in the planning process of the clubs often (Gill et al., 2010). According to Hensley et al. (2007), allowing youth to have a role in the decision making process, increases a youth's sense of belonging and allows the youth to take ownership in 4-H. Previous research has stated, teens that choose to participate in youth organizations, are guided by caring adults who are giving teens the opportunities to be a major part of the decision making process (Heinsohn & Lewis, 1995). Scales and Leffert (1999) reported youth who have opportunities to make decisions develop an "…understanding that they are accountable to themselves, their families, and their communities" (p. 53).

Responses were analyzed in relation to the question, explain a time when they helped plan a 4-H event. Through the analysis of the responses, three common themes emerged: planning club activities, planning county and regional 4-H events, and never planned an event. Through a members' role as a club officer they are given the opportunity to plan 4-H events/activities often (Gill et al., 2010). The opportunities to plan 4-H events category was included in the study to discover specific events and activities that 4-H leaders and extension educators feel comfortable allowing the 4-H members to plan. By knowing this information, 4-H leaders and extension educators can evaluate their clubs and determine whether the 4-H members, in their respective clubs, are given enough opportunities to feel as though they are an integral part of the club organizational structure.

Planning club activities.

Numerous 4-H members stated they had the opportunity to plan club activities such as: shows, banquets, meetings, picnics, trips, officer trainings, and game nights. For example, "[A 4-H member] was chair of the recognition banquet committee for the club. [They] planned what food [they] were going to have and helped organize and acquire the materials to put on the dinner" (m.117). In addition to banquets, 4-H members also were given the opportunity to "…plan and present a 4-H [subject specific] Day Camp. [The 4-H member] planned the whole lesson and with the help of [their] extension agent [the 4-H member] planned the location" (m.155).

Planning county and regional 4-H events.

The 4-H program extends far beyond the individual specialized clubs in the communities which the members may live. Participants stated they take full advantage of the opportunities provided beyond the club, volunteering to assist in the planning process of county and regional 4-H events. Involvement in teen councils allowed 4-H members the opportunity to "…plan the county achievement night, including the program, awards, and entertainment" (m.185) and one 4-H member even "…helped put together a teen group in [their county]. [Putting together the teen group] required calling all the teens in the county, inviting them to a meeting, giving them an incentive to come and pushing my friends to come and increase the population" (m.147). Planning involvement does not stop at the county level, attending camp counselor training allowed one member "…to help plan [Camp] - the theme, daily themes, etc" (m.116), also "…being a counselor, [the 4-H member] had a part in planning the [Regional Camp]" (m.185) and "…round-up events" (m.108).

Never planned an event.

Numerous participants in this study responded that they never helped plan a 4-H event at any level. Many of the participants simply answered with a simple "none" when responding the question of: Explain a time when you helped plan a 4-H event.

Factors that Would Encourage Increased Participation

The factors that would encourage increased participation category allowed the researchers to discover the limitations 4-H members experience as well as what would increase the desirability of the events/activities. When asked to describe what would encourage them to participate more often in 4-H events/activities at the county, regional and state levels, responses were analyzed resulting in three common themes: friends and the opportunity to meet new people, more available resources (i.e. money, time, and transportation), and more information provided on the events.

Friends and the opportunity to meet new people.

Individuals mentioned they would be more involved in activities and events if more of their friends would be involved. The more friends they have within the 4-H will assist in encouraging members to participate in events and activities beyond the club level, because the members would have a chance to spend time with their friends (see Figure 2). Friends and meeting new people was identified as a major influence that would encourage more participation in county, regional, and state events/activities. One member mentioned "I would be more motivated to participate in 4-H activities if more people in my county did 4-H. Hardly any of my friends are in 4-H and I would have more fun if they were" (m.117).

Through participating in the county, regional, and state events/activities the 4-H members are meeting a larger number of people thus increasing their opportunities to create new friendships. One 4-H member mentioned, "what motivated me were my friends I made through 4-H. I know that unless I attended more 4-H functions I probably wouldn't have been able to see them" (m.161). According to Kress (2005), feeling a sense of belonging increases the chance of youth attaining positive outcomes. Additionally, having a sense of belonging may also encourage youth to stay enrolled in 4-H (Hensley et al., 2007)

More available resources.

Availability of resources, outside of those controlled by the 4-H program, hinders 4-H participation as well. These resources include; money, time, transportation, and family obligations. According to 4-H members, "the main thing that would probably get me to more events/activities at the county, regional, and state levels would be if the events cost less money or if there were more scholarships for our individual counties" (m.178). Furthermore, "finances limit things greatly for me, this is my last year in 4-H, but the first time I have been at SLC" (m.150), so "a smaller cost to attend some events…." (m.185) would encourage more participation. In addition to financial problems, "if I had more time I would attend more

events…" (m.139) was also mentioned. Many members "…just don't have enough time to participate" (m.154) and therefore"… nothing else would make [them] come more" (m.146).

More information provided on the events.

Members mentioned the lack of information, relative to the activities that would take place at 4-H events, discourages their participation. A member stated "many times I would like to participate in more events of 4-H, but my leaders do not supply us with the information or encourage us to do it. My leaders have the attitude of doing just enough to show at the fair" (m.172) and another member mentioned "if I could learn more about the activities provided, I would participate often" (m.143). Members joined 4-H to help develop public speaking and leadership skills. A few members mentioned they were ill-informed about the potential for life skills building that particular 4-H events/activities may offer. It was stated "what would help more is if someone representing the event and told/showed what is going to happen at it" (m.141).

Common Themes Across Categories

After reviewing the data for the three categories; most memorable 4-H experience, opportunities to plan 4-H events, and factors that would encourage increased participation, it is noted that friendships and meeting new people, club activities/events, and county activities/events were common themes across two of the three categories examined. Through these themes it can be acknowledged that there are specific aspects and/or events within 4-H that encourage more 4-H members to remain involved such as, "going to [state achievement] days and participating in Dairy Judging and meeting new people and making new friends" (m.137) or "…planning 4-H club meetings and making the final decision in what needs to be done and what we are going to discuss" (m.161). "[Four-H members] help plan a bunch of events with county council…" (m.141). One 4-H member "…was in charge of Secretary workshop…" (m.141) at the county officer training workshop and the 4-H member "…made a puzzle and showed a slide show…" (m.141). According to the 4-H member the workshop "…turned out great" (m.141). Some 4-H members remember

> …club meetings…were some of the greatest times [they] ever had. Meeting with all [their] friends was amazing. [Their] leaders helped [them] with everything. Some of the people they saw there, [they] only saw at the meetings so it was always fun. Some of [their] best friends [they] met at those meetings. (m124)

Conclusions and Recommendations

Most Memorable 4-H Experience

Participants in the study indicated a need affiliation and achievement (McClelland, 1987) when asked to share their most memorable 4-H experience. Whether the experience was a fair, show, leadership event, or club activity the members indicated the importance of being with other people. These interactions are what seemed to stay with the members throughout their 4-H experience, as the experiences help the member to feel important to others, while having fun.

The members also indicated that recognition for their achievement was important. Thus, continued opportunities for members to connect with other 4-H members and leaders should be encouraged. Also, leaders should continue to recognize members for their accomplishments at the club, county, regional, and state levels.

Opportunities to Plan 4-H Events

Members are being given opportunities to plan events through 4-H at the club, county, and regional levels. No matter the "level" or the purposes of the event, planning of events/activities provide the members opportunities to meet their need for power and achievement (McClelland, 1987). By being part of a team that is developing an activity, members are given leadership responsibility and are given the opportunity to achieve goals that either they have set as a team, or that have been set for them by a leader of the 4-H. Teenage youth need to feel like an integral part of program administration (Brennan et al., 2007; Larson, 2000; Lauver & Little, 2005). Four-H educators and leaders should continue to allow members to assist in program facilitation and add new opportunities for planning, leading, and facilitating activities/events (Hensley et al. 2007). Through the experience of planning events and leading others, 4-H members can fine tune their time management and organizational skills. In turn, these skills will assist members in their future.

Factors that Would Encourage Increased Participation

Members need to see the value in the experiences provided through 4-H, as well as see the opportunity to be with friends (McClelland, 1987). Many 4-H members find it difficult to participate in the numerous opportunities that are presented to them as they age and transition from middle school to high school (Weiss, Little, & Bouffard, 2005). One way to compete with other activities is to ensure that all 4-H activities and events are age appropriate and present an appropriate level of challenge to the member (McClelland, 1987). Leaders and extension educators should evaluate programs and be sure to incorporate events/activities that are age appropriate and appealing. Additionally, teens involved in 4-H programming should be included in the evaluation of the programs (Acosta & Holt, 1991; Harder et al., 2005; Hensley et al., 2007; Lauver & Little, 2005).

Opportunities available to members need to publicized and show how members can advance their life skills, while having fun with others (McClelland, 1987). Lack of sufficient information about 4-H activities limits a member's participation. When members know about an activity and how it can benefit them, they are more likely to take the time to participate. Also, by getting members to interact with their friends will also add to the likelihood of participation. The allocation of funds to produce informational materials focused on particular activities would allow 4-H members to be better informed about happenings beyond the club level. If the 4-H members do not view the activity/event as beneficial in building life skills then they are less likely to attend. In addition to the informational materials, former attendees (Lauver & Little, 2005) of the activities/events should travel to 4-H club meetings, informing members of how they benefited through their attendance. When younger members see the benefits older members have gained through an experience, they want to become part of that experience. The members'

need for affiliation (McClelland, 1987) can be fulfilled through the actual participation in similar events as their fellow members.

The cost of participating in 4-H events/activities limits some 4-H members' ability to be involved (Brennan et al., 2007). Members can overcome many of the barriers associated with participation in an event by simply knowing about the event, feeling as though they are a part of the group (affiliation), and knowing they will gain from the event (achievement). However, the actual financial burden to participation often cannot be as easily overcome. Therefore, opportunities should be provided to members to offset the cost of participation. Various fundraisers could be established at the club level to help members pay for their experiences. By offering more opportunities for 4-H members to earn/win registration fees for county, regional, and state events, members would be encouraged not only to participate in these events, but this would also increase participation in club activities. In addition, Extension educators and 4-H leaders should seek funding from outside sources to assist in providing funding for registration fees.

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Secondary Agricultural Educators: How Prepared Are They To Provide An All Inclusive Learning Environment?

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Abstract

The purpose of this descriptive survey study was to gauge the readiness of secondary agricultural educators throughout the United States to foster inclusive learning environments for all students as perceived by state directors and supervisors. Secondary agricultural education teachers were perceived to be prepared to serve women and socioeconomic diversity, but not ethnic minorities, learning style diversity, diversity of gender identification, religious diversity, and special needs populations. It was found that agricultural education is beneficial for ethnic minorities and women, but still there is a disconnect by secondary agricultural teachers to handle these issues. Barriers to inclusion in secondary agricultural education were found to be guidance counselors, the perception of agriculture itself, the lack of role models, the lack of understanding student styles, and stereotypes. It was recommended that secondary agricultural education professionals receive preservice and inservice training in multicultural education and differentiated instruction, and that relationships be formed with school officials and the community in general in order to foster inclusion efforts.

Introduction

The United States has become more culturally and linguistically diverse (Faltis, 2006). Since the 1980s the population has grown at the rate of nine percent per year, creating a significant increase in Hispanic, Asian, Pacifica Islander, Native American, and multiracial populations (Files, 2005). These demographic changes have greatly impacted America's public schools, which has grown to an enrollment of over 50 million students and contains multiple races, cultures, and other types of diversity (Feller, 2005). Given this factor, diverse students are likely to experience conflicts if schools are not sensitive to their culture, language, family background, religion, sexual orientation, and learning styles (Short and Echevarria, 2005). When considering the teaching workforce in America, it is comprised of European Americans (86%), female (75%), and middle-aged workers. Many factors can affect the instructional environment, one of which is the communication channels between students and teachers that affect the development of inclusive learning environments (National Education Association, 2003). Given the fact one out of four jobs in America is agricultural related, more emphasis needs to be placed on creating and implementing opportunities for inclusiveness through efforts of agricultural literacy.

One major area of inclusion that affects U.S. public schools is socioeconomic factors such as family type and family income. Over the past two decades the U.S. family structure has greatly changed due to facts such as high divorce rates, economic pressure requiring both parents to work, and welfare reform (Smith, Gartin, Murdick, and Hilton, 2006). Fewer than 50% of children live with both biological parents; furthermore, it is estimated that 59% of all children will live in a single-parent household before they reach the age of 18. With respect to income, according to the National Center for Children in Poverty, in 2006 nearly 13 million children or 17% lived in families with incomes below the federal poverty level. The problem of poverty becomes even more pronounced when analyzing ethnicity (33% African American, 27% Latino, and 40% Native American). Students within the aforementioned categories can experience great academic problems for a variety of reasons (Fass and Cauthen, 2007).

There are various issues of concern teachers must realize when working with students from different social, cultural, and ethnic backgrounds. When teaching students with a background other than their own, it is recommended that teachers make every effort to learn each student's unique background being conscious that a student's cognitive development is based on his or her learned experiences. Many secondary agricultural educators' social and academic expectations are greatly based on mainstream and middle-class culture to which they are experienced (Alston, English, Faulkner, Johnson, and Hilton, 2008). In relation to learning styles, culture greatly impacts the way individuals process, organize, and learn material. Students from polychromic cultures may engage in many different activities, including talking all at one time, in contrast to monochromic cultures which may prefer working without talking. Another area of inclusion that more emphasis should be applied toward is students with disabilities. Mainstreaming and inclusionary practices have increased the number of students with disabilities in agricultural education programs (Cotton, 2000; Gagnon and Keith, 1988; Kessell, 2005; Schwager and White, 1994).

For teachers to be able to effectively instruct special needs students they should have a working knowledge of how to identify intervention methods and instructional methods. Prior studies by (Baggett, Scanlon, and Curtis, 1985; Baggett and Chinoda, 1994) indicated that agricultural teachers were deficient in the proper pre-service knowledge of how to teach special needs students. Consequent studies by Dormody and Torres (2002); Elbert and Baggett (2003); and Sorenson, Tarpley, and Warnick (2005) concluded that agricultural teachers are not competent in either how to effectively instruct special needs students nor possess an understanding of the Individuals with Disabilities Education Act (IDEA). By changing the educators' attitudes toward working with special needs students, this attitude shift will assist in the endeavor of creating collaboration between all students thus decreasing classroom discipline (Cooper, Bocksnick, and Frick, 2002).

So the question is posed, how can secondary agricultural educators address the needs of all of the aforementioned populations in order to create inclusive learning environments? Is agricultural education prepared for the great demographic changes that are impacting American public schools?

Conceptual Framework

Inclusion is a philosophy that brings students, families, educators, and community members together to create schools and other social institutions based on acceptance, belonging, and community (Sapon-Shervin, 2003). Inclusion is based upon four major principles: (1) All Learners and Equal Access, (2) Individual Strengths and Challenges and Diversity, (3) Reflective Practices and Differentiated Instruction, and (4) Community and Collaboration.

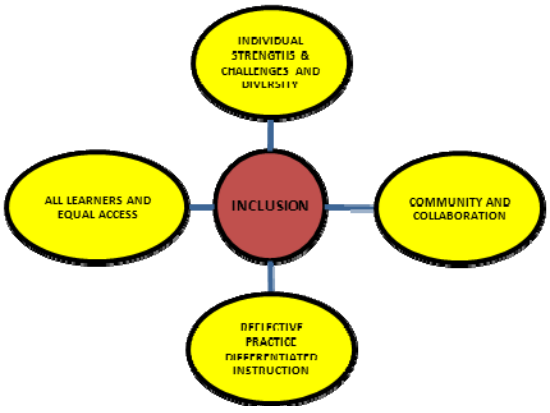

Figure 1. Inclusion Conceptual Framework

Each of the four principles can be defined as follows:

1. ***All Learners and Equal Access*** emphasizes that effective inclusion improves the educational environment for all learners by placing them together in general education classrooms, regardless of their race, linguistic ability, economic status, sexual orientation, family structure, cultural and religious background, and learning ability (Roach, Salisbury, and McGregor, 2002).

2. Individual Strengths and Challenges and Diversity emphasizes sensitivity and acceptance of individual strengths and challenges and diversity. Diversity improves the educational systems for all students by placing them in general education environments regardless of race, ability, gender, economic status, gender, learning styles, ethnicity, cultural background, religion, family structure, linguistic ability, and sexual orientation.

3. ***Reflective Practice and Differentiated Instruction*** requires educators to examine their attitudes, teaching and classroom management practices, and curricula to accommodate individual needs. Educators must constantly evaluate their daily professional practice in order to optimize the educational learning environment for all of student clientele, regardless of their respective differences (Banks, 1994).

4. ***Community and Collaboration*** involves groups of professional educators, parents, students, families, and community agencies working together to build effective learning environments (Salend, 2008). Optimal educational environments involve collaborative efforts among all educational stakeholders in order to ensure that the greatest amount of learning can take place for all students (Banks, 1994).

Purpose and Objectives

The purpose of this descriptive survey study was to gauge the readiness of secondary agricultural educators throughout the United States to foster inclusive learning environments for all students. To guide this study the following research questions were developed:

1. What is the perceived level of preparation of secondary agricultural educators to foster an inclusive learning environment for various types of diversity?
2. What are the perceived benefits of inclusion in secondary agricultural education programs as viewed by state directors/supervisors of agricultural education?
3. What are the perceived barriers to inclusion in secondary agricultural education programs as viewed by state directors/supervisors of agricultural education?
4. What are the perceived solutions to facilitating inclusive learning environments in secondary agricultural education programs as viewed by state directors/supervisors of agricultural education?
5. What are the demographic characteristics of state directors/supervisors of agricultural education?
6. What are the demographic characteristics of agricultural education programming in the states under study?

Methods

The population for this study consisted of all state directors/supervisors of agricultural education (N = 52, including Puerto Rico and the Virgin Islands) as provided by the National Association of Supervisors of Agricultural Education. A review of the sampling frame revealed at the time of data collection that three states did not have a director currently employed, thus reducing the sampling frame to n = 49. The survey utilized for this descriptive census study was adapted from a previous study conducted by Warren and Alston (2007). Modifications were made to specific sections of the survey in order to accommodate the research focus of this particular study, with one section being added in order to gauge agricultural teacher's level of preparation for fostering inclusive learning environments. The revised survey instrument for this study consisted of five sections: Part I. Benefits Of Inclusion, Part II. Barriers To Inclusion, Part III. Proposed Solutions To Foster Inclusion In Secondary Agricultural Education, Part IV. Level of Preparation To Foster Inclusion In Secondary Agricultural Education, and Part V. Demographic and Program Characteristics. Parts I - IV consisted of Likert-type items; Part V consisted of a series of open-ended and multiple-choice items. Sections I - III consisted of 10 questions each and utilized a five-point Likert-type scale with the following responses: 1=Strongly Disagree, 2=Disagree, 3=Uncertain, 4=Agree, and 5=Strongly Agree. Section four utilized the following Likert-type scale: 1 = Not Prepared, 2 = Somewhat Prepared, 3 = Undecided, 4 = Prepared, 5 = Very Prepared.

The validity of the instrument was originally established by means of content validity. Brown (1983) defined content validity as "the degree to which items on a test representatively sample the underlying content domain" (p. 487). Brown recommended using expert judges as one means of establishing content validity. A panel of experts at North Carolina Agricultural and Technical State University consisting of researchers with experience in the area of inclusion reviewed the original instrument for content validity. The same panel of experts were asked to review the revised instrument for content validity. The instrument was judged to be valid in order to accomplish the specific purpose of this study. In order to establish the reliability of the revised instrument a pilot test was conducted upon randomly selected county level directors of career and technical education in North Carolina. The Cronbach's alpha reliability coefficients for the sections of the survey were Part I: .88; Part II: .91, Part III: .85, and Part IV: .84, thus the instrument was deemed to be reliable. In relation to data collection a one week-interval, three-round data collection method was utilized following conventions established by Dillman (2009) for email surveys. The final response rate was 85% (n = 42). In order to control for non-response error, Miller and Smith (1983) recommended comparing early to late respondents. Upon completion of the study, an evaluation of the data showed that there were no significant differences found among the early respondents (respondents during the first round) and the late respondents (respondents after the first round).

Findings

Research Question One Findings

In Table 1 with respect to working with women and socioeconomic diversity it was perceived that agricultural educators are prepared. In contrast it was found that secondary agricultural educators were somewhat prepared to work with English As a Second Language (ESL) students. Moreover, respondents were undecided if secondary agricultural educators were

prepared to work with individuals with learning disabilities, learning style diversity, special needs populations, diversity of gender identification, and ethnic minorities.

Table 1

Teacher Inclusion Preparation

Level of Preparation	**Mean**	**SD**
Women	4.20	1.03
Socioeconomic Diversity	3.59	1.22
Individuals With A Learning Disability	3.46	1.12
Learning Style Diversity	3.32	1.03
Special Needs Populations (Physical and Mental Disability)	3.10	1.09
Diversity of Gender Identification	2.90	1.42
Ethnic Minorities	2.83	1.18
Religious Diversity	2.66	1.13
English As A Second Language (ESL)	2.27	1.14

Note. Scale: 1 = Not Prepared, 2 = Somewhat Prepared, 3 = Undecided, 4 = Prepared, 5 = Very Prepared

Research Question Two Findings

Table 2 displays the findings in relation to the perceived benefits of inclusion in secondary agricultural education. It was agreed upon by respondents that secondary agricultural education is beneficial for women and minority students in relation to their leadership and character development. Moreover, it was found that inclusion is beneficial for secondary agricultural education and FFA programs overall.

Table 2

Benefits of Inclusion

Benefits To Inclusion	**Mean**	**SD**

Secondary agricultural education provides women with the opportunity for character development.	4.68	.47
The inclusion of diverse populations in agricultural education is benefit for all agricultural education stakeholders.	4.63	.73
Inclusion broadens the perspectives of agricultural students.	4.59	.54
Inclusive learning environments cans sharpen students' critical thinking skills.	4.56	.59
Inclusive learning environments can broaden the perspectives of secondary agricultural teachers.	4.54	.55
Secondary agricultural education provides minorities with the opportunity for leadership development.	4.54	.59
There are many benefits for FFA programs which foster inclusive learning environments.	4.51	.55
There are many benefits for secondary agricultural education programs which foster inclusive learning environments.	4.49	.55
Secondary agricultural education provides minorities with the opportunity for character development.	4.46	.67

Note. Scale: 2 = Strongly Disagree, 2 = Disagree, 3 = Uncertain, 4 = Agree, and 5 = Strongly Agree

Research Question Three Findings

Table 3 provides the findings in relation to the perceived barriers to inclusion in secondary agricultural education programs. It was agreed upon that the lack of role models, the perception of agriculture itself, the lack of understanding a students' learning style, and stereotypes hinder the development of inclusion in secondary agricultural education. It was also agreed upon that guidance counselors are a major barrier to inclusion in secondary agricultural education. In contrast to the aforementioned findings, respondents were undecided if school administrators and the lack of training in special education were barriers to creating inclusive learning environments. Sexual harassment was perceived not to be a barrier to inclusion.

Table 3

Barriers to Inclusion

Barriers To Inclusion	**Mean**	**SD**
A lack of role models hinders the participation of minorities in agricultural	4.10	.73

education.

The perception of agriculture itself influences the participation of minorities in agricultural education.	4.02	.72
The lack understanding a student's unique learning style can be a barrier in relation to creating an inclusive learning environment in secondary agricultural education.	3.93	.81
Guidance counselors influence the participation of ethnic minorities in agricultural education.	3.88	.90
Guidance counselors are barrier in relation to creating inclusive learning environments in secondary education.	3.66	1.03
The perception of agriculture itself hinders the development of inclusive learning environments within secondary education.	3.59	.92
Stereotypes are a primary reason why minorities do not enroll in secondary agricultural education.	3.51	1.05
A lack of training in special education hinders the participation of special needs populations in secondary agricultural education.	3.20	1.10
School administrators are a barrier in relation to creating inclusive learning environments in secondary education.	3.00	.97
Sexual harassment is a factor as to why women do not enroll in secondary agricultural education courses.	1.80	.90

Note. Scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Undecided, 4 = Agree, 5 = Strongly Agree

Research Question Four Findings

Table 4 displays the perceived solutions to fostering inclusion in secondary agricultural education. It was agreed upon that forming relationships within the local community, with advisory groups, and with guidance counselors were inclusion solutions. Furthermore, it was perceived that preservice and inservice training in differentiated instruction and multicultural education were solutions to fostering inclusion. It was also agreed upon that school administrator support and content analysis of curriculum materials were solutions to fostering inclusive learning environments.

Table 4

Solutions to Foster Inclusion

Solutions to Foster Inclusion	Mean	SD
Guidance Counselor/Agricultural Education Teacher Partnerships in Recruiting and Retaining Students Into Secondary Agricultural Education Programs	4.29	.64
Secondary Agricultural Educators Forming Local Community Relationships With Diverse Groups	4.27	.54
Secondary Agricultural Education Program Inclusion Marketing Efforts	4.20	.60
Local Secondary Agricultural Education Advisory Group's Support of Inclusion	4.17	.73
School Administration Support For Agricultural Education Inclusion Efforts	4.15	.76
Inservice Teacher Training In Differentiated Instruction	4.10	.62
Preservice Teacher Training In Differentiated Instruction	4.07	.60
Inservice Teacher Training In Multicultural Education	3.85	.69
Content Analysis of Agricultural Education Curriculum Materials To Ensure An Inclusive Learning Environment	3.83	.77
Preservice Teacher Training In Multicultural Education	3.80	.71

Note. Scale: 1 = Not Prepared, 2 = Somewhat Prepared, 3 = Undecided, 4 = Prepared, 5 = Very Prepared

Research Question Five Findings

In this study the majority of respondents were 49 years of age and white males who held a graduate degree. Additionally, respondents had taught secondary agricultural education for 12 years, had been a state supervisor for 10 years, and lastly had taken almost 10 hours of training in relation to inclusion within the past five years (see Table 5).

Table 5

State Supervisor's Demographics

State Supervisor's Demographics	n	Mean or %
Age		49
Gender:		

Female	9	21.4
Male	33	78.5
Race/Ethnicity:		
Black	1	2.4
White	38	90.4
Hispanic	2	4.9
Native American	0	0
Asian/Pacific Islander	1	2.4
Other	0	0
How many years did you teach secondary agricultural education?		12
Degree:		
Bachelor	4	9.5
Master's	24	57.1
Specialist	6	14.3
Doctorate	8	19.0
How many years have you been a state supervisor of agricultural education?		10
How many hours of training/professional development have you taken in relation to inclusion in the past five years?		9.5

Research Question Six Findings

Table 6 displays the demographics for state FFA/Agricultural Education programs. The majority of students enrolled in secondary agricultural education programs were white, followed by Hispanic and black students. Additionally males comprised the majority of FFA members. The average FFA state membership was 7,698.

Table 6

State FFA/Agricultural Education Demographics

State FFA Demographics	**Mean or %**
State's current FFA membership	7,698
State Agricultural Education Ethnicity:	
Black	
White	4.6%
Hispanic	78.9%
Native American	8.1%
Asian	2.7%
Other	1.0%
	4.5%
State FFA Ethnic Breakdown:	
Black	3.5%
White	78.6%
Hispanic	7.2%
Native American	2.4%
Asian	.57%
Other	4.2%
FFA Gender Breakdown:	
Female	39.2%
Male	60%

Conclusions

State directors of agricultural education agreed that secondary agricultural education was overall beneficial for ethnic minorities, but yet were undecided about the level of preparation that

agricultural teachers have in working with this population. This finding can be directly tied to the low percentage of minorities that participate in secondary agricultural education in general. Given the influence that teachers have upon their respective instructional programs, barriers such as the lack of teacher role models, the traditional image of the secondary agricultural education programs, and the understanding of student's learning styles can be changed by proactive and visionary agricultural education teachers. Respondents indicated that secondary agricultural education teachers are prepared to work with female students and that sexual harassment is not a barrier for female agricultural education students, which can be directly related to their perception that secondary agricultural education is overall beneficial for female students. When considering that females currently hold over 50% of state leadership positions in FFA nationally, one could attest to the increasing presence of women, in what has been a traditionally male field.

When taking a student's socioeconomic status into consideration, state directors indicated that secondary agricultural education teachers were prepared to work with this population. Given the fact that a great percentage of students enrolled in career and technical education programs nationally have traditionally come from lower income backgrounds, secondary agricultural education teachers have a long tenure in serving the educational needs of this respective group. In contrast it was found that state directors were undecided about whether teachers are prepared to work with individuals with a learning disability and special needs populations. Respondents were also undecided if a lack of training in this area was a barrier to inclusion in secondary agricultural education; however, it was recognized that not understanding a student's learning style was a barrier and that training in differentiated instruction is needed. Given the aforementioned factors, it is possible that state directors are not fully aware of the impact that properly serving the unique needs of special populations could have upon secondary agricultural education, but yet recognize that something does need to be done to accommodate this sector of the student population.

It was also found that respondents were undecided about the preparation of secondary agricultural education teachers to service students with diversity of gender identification and diversity of religion. Perhaps teachers are not receiving enough preservice and inservice training in these areas, especially given the diversity of students in public schools. Lastly, it was perceived that secondary agricultural educators are somewhat prepared to serve English as Second Language (ESL) students. When considering the consistently increasing percentage of immigrants in the United States each year, school systems and teacher education programs nationally will have to reconsider how pre-service and in-service education professionals are being trained in this area. Respondents perceived guidance counselors to be a barrier to inclusion in secondary agricultural education, but not school administration. Perhaps school administrators see the value of inclusion in secondary agricultural education and are more supportive of the programs than guidance counselors.

Recommendations

Given the aforementioned findings, it is recommended that pre-service and in-service agricultural education professionals receive training in differentiated instruction and multicultural education. As the number of culturally and linguistically diverse students increases

and the number of students with disabilities swells, agricultural education professionals must have the ability to transform the classroom into engaging contexts where individual student needs are met. Having the ability to create "different avenues to acquiring content, to processing or making sense of ideas, and to developing products so that each student can learn effectively" will allow agricultural education professionals to transform teaching and learning in the classroom (Tomlinson, 2001, p.1). With its focus on student centeredness, assessment, and proactive responsive individualized instruction, pre-service and in-service agricultural education professionals will have the skills to shake up what occurs in the classroom to engage all learners. For differentiated instruction to occur, agricultural education professionals must first understand the various cultures, values, and beliefs present within their classrooms which requires intense, focused multicultural education training. Differentiated instruction requires the agricultural education professional to look at a classroom through many eyes which requires understanding various perspectives present within a classroom and understanding how to present information from multiple perspectives. Multicultural education prepares preservice and inservice education professionals to consider these perspectives while attending to issues of equity, prejudice reduction, knowledge construction, content integration, and student empowerment. If pre-service and in-service agricultural education professionals are truly to engage learners so they may make learning meaningful, relevant, and rigorous, enhancing their knowledge of differentiated instruction and multicultural education is a necessity.

To foster support for inclusion efforts, secondary agricultural educators should develop relationships with guidance counselors and school administrators to ensure they understand what agricultural education is and what the profession entails. Expanding their understanding of agricultural education may open the discipline to more students who may have interest in the profession. Secondary agricultural educators also must cultivate relationships with the local community. Pre-service and in-service agricultural education professionals must utilize the resources available to them to make the learning process more engaging to diverse students. Building relationships with local youth councils, specific community groups that focus on select demographics (i.e., 100 Black Men), or community organizations like Boys and Girls Club, YMCA, 4-H, or church groups provides secondary agricultural educators with numerous avenues to educate the community about the profession or real-world sites to engage in agricultural related activities.

Implications

The concept of diversity directly impacts the agricultural industry in the United States because the agricultural industry is not representative of the diverse population present within this country. In order for the United States to sustain its current agricultural rank, recruitment of a more diverse future workforce must be enhanced. The field of education and agribusiness as a whole must acquire an understanding of the motivational factors and rewards that would motivate or encourage diverse groups to pursue an agricultural career.

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A Comparison of Early Career Agriculture Teachers in Two States: Perceived Success in Teaching Students with Special Needs

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Abstract

This study sought to compare the perceptions of beginning agriculture teachers' ability to teach students with special needs between a state requiring special education pre-service coursework and a state without required coursework for teacher certification. With similar demographic characteristics, the self-perceived efficacy of respondents from Missouri was 4.72 (SD = .90) and 4.59 (SD = .87) for North Carolina. Teacher efficacy uniquely accounted for 27 % of the variance in self-perceived success for Missouri, and 40 % of the variance in self-perceived success for North Carolina, while controlling for administrator support, teacher preparation, and in-service participation.

Introduction

Students with special needs have been mainstreamed into regular classrooms since 1975 when Federal laws mandated students be educated in the least restrictive environment (Treder, Morse & Ferron, 2000). Beyond the normal challenges faced by adolescence, students with special needs also face challenges created by their individual disabilities (Lerner, 2003). For example, students with special needs may lack the attention span necessary for a majority of high school classes. Despite pre-service instruction focused on teaching adolescents, pre-service teachers may not acquire the necessary teaching methods for teaching students with specific learning deficits (Mims, Harper, Armstrong, & Savage, 1991).

Most students with special needs require modifications and/or adaptations (Mastropieri & Scruggs, 1995). Individualized Education Plans (IEPs) outline the type of modifications and services students with special needs should receive and provide direction for classroom teachers (Algozzine, Ysseldyke, & Campbell, 1994). Many teacher education programs require coursework in special education for all pre-service teachers to prepare future teachers for the challenges of implementing IEP's (Powers, 1992).Subject specific teachers must also be prepared to implement IEPs (Sharpe & Hawes, 2003).

Subject specific areas, such as agricultural education, have addressed the topic of students with special needs (Elbert & Bagget, 2003; Kessell, Wingenbach, Burley, Lawver, Fraze & Davis, 2006a, 2006b). Elbert & Baggett (2003) suggested agriculture instructors experience a number of challenges when special needs students are incorporated into their classroom. Technical classes may present even greater modifications and thus greater challenges. In addition, special education teachers seldom have experience working in technical classrooms, making it more difficult for them to assist technical teachers (Evers & Bursuck, 1995). Furthermore, safety can become an additional concern in technical laboratory courses when students with special needs are enrolled. Complex tasks and a wide variety of equipment may overwhelm some students with special needs. Furthermore, students with special needs who enroll in career and technical education classes often experience similar challenges to student with special needs enrolled in "core" academic subjects (Evers & Bursuck). Agriculture teachers must be prepared to provide appropriate instruction to this group of students. Are secondary agriculture teachers confident they can teach students with special needs? What factors determine the efficacious beliefs of secondary agriculture teachers who instruct students with special needs? Do pre-service requirements affect the efficacious beliefs of agriculture teachers who instruct students with special needs?

Theoretical Framework

Self-efficacy is often viewed through Bandura's (1986) social cognitive theory. Efficacy describes confidence in one's ability to accomplish tasks in a specific domain. Self-efficacy influences a person's acquisition of specific skill development and demonstration of behaviors related to that domain (Bandura, 1997; Ormrod, 2004). Self-efficacy connects knowledge and action and strongly influences the accomplishments a person will attain (Plourde, 2002; Soto & Goetz, 1998). Low self-efficacy can make situations appear to be more difficult than they really are and promotes an increase in stress and depression (Soto & Goetz, 1998). As a result, those

who doubt their ability in a specific domain will often avoid difficult tasks in that domain (Bandura, 1997). Although knowledge, skills and past accomplishments are not always strong predictors of future achievement (Bandura, 1986), highly efficacious individuals in a specific domain will approach difficult tasks within the domain as challenges to overcome (Pajares, 1997). In fact, self-perception of their capabilities, or efficacy, may offer a better prediction of future behavior. Furthermore, self-efficacy is critically important to how well knowledge and skills are acquired (Pajares). Efficacy can be viewed through specific domains, such as teaching.

Teacher efficacy has been the topic of considerable research (Ashton & Webb, 1986; Bandura, 1977; Brownell & Pajares, 1999; Guskey & Passaro, 1994). Teacher efficacy is the belief that both desired learning outcomes will be achieved (Soto & Goetz, 1998) and student achievement will occur (Hoy & Spero, 2005). Treder, Morse, and Ferron (2000) suggested "the level of responsibility a teacher will assume for educating students with behavior or learning problems is related to specific attitudes that the teacher holds" (p. 202). A high personal teaching efficacy indicates teachers' confident in their ability to promote student learning (Hoy & Spero, 2005). "Teacher's efficacy beliefs appear to affect the efforts teachers invest in teaching, their level of aspiration, and the goals they set" (Hoy & Spero, p. 745). A teacher with a high sense of self-efficacy will provide students the guidance they need to succeed and devote more time to academic pursuits (Bandura, 1997). Teacher efficacy also influences classroom practices such as praise instead of criticism, enthusiasm, and acceptance of students' opinions (Soto & Goetz). Student achievement and attitude toward learning has correlated to teacher efficacy (Goddard, Hoy, & Hoy; Midgley, Feldlaufer, & Eccles, 1989). Students with a highly efficacious teacher felt they were performing better and the subject was less difficult than students who had teachers possessing lower self-efficacy. Similarly, Ashton and Webb found teacher's self efficacy was related to their instructional practices and to student achievement. Twenty years of research has "established a strong connection between teacher efficacy and teacher behaviors that foster student achievement" (Goddard et al. p. 480). However, teachers do not always feel the same level of efficacy in all teaching situations. Teacher efficacy may be content specific. Teachers may feel efficacious for certain students in specific settings and teaching particular subjects. Teacher efficacy may differ under diverse circumstances (Goddard et al.). Teaching students with special needs may be an example of a specific setting, and thus teachers' sense of efficacy may change. Not surprisingly, highly efficacious discipline specific and special education teachers are more likely to recommend a regular classroom placement for students with special needs than teachers with low efficacy in this domain (Soodak & Podell, 1993).

Teacher efficacy, self confidence and personal satisfaction of beginning teachers in subject specific areas such as agricultural education have also been studied. Joerger and Boettcher (2000) found self-confidence and personal satisfaction impact beginning agriculture teachers. Knobloch and Whittington (2002) found teacher efficacy of novice and student teachers was associated with teacher preparation quality, collective efficacy, and student teaching experience. Student teachers and novice teachers may need to believe they contribute to an efficacious group of teachers (Knobloch & Whittington, 2002). Additionally, Knobloch and Whittington (2003) found pre-service and novice teachers demonstrating a higher commitment to their careers were more efficacious after applied teaching experiences. More specifically, commitment to the

teaching profession may be impacted by early teaching experiences (Knobloch & Whittington, 2003).

Raundenbush, Rowan, and Cheong (1992) investigated 315 high school teachers and determined teachers instructing honors classes were more efficacious that vocational and discipline specific teachers. In addition, Watson (2006) noted academic achievement impacted teacher efficacy. However, teachers' years of experience does not appear related to their level of efficacy (Watson). Brownell and Pajares (1999) identified three factors affecting a teacher's self-efficacy when assisting students with special needs. These factors included pre-service preparation, in-service participation, and administrative support (Figure 1).

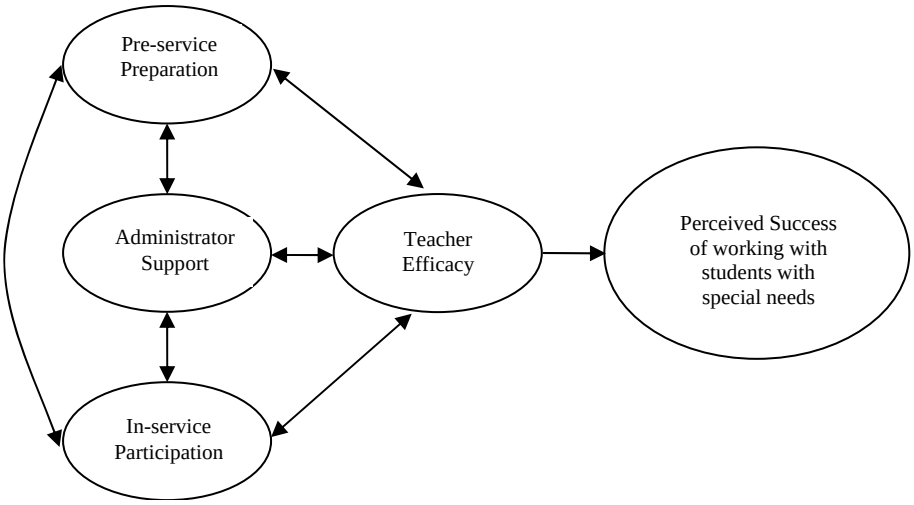

Figure 1. Conceptual Model of Factors Affecting Self-Perceived Success
Adapted from Brownell and Pajares (1999)

Pre-service teacher preparation includes both traditional coursework and student teaching. Student teaching experience places a student in a teaching/learning setting under the supervision of an experienced teacher. This field based learning experience provides an opportunity for modeling. Bandura (1997) suggested a person's self-efficacy may be enhanced through modeling and observing or visualizing successful practices. For example, Brownell and Pajares (1999) found pre-service experiences to be a direct indicator of a teacher's self-efficacy and self-perceived success when working with students with special needs. Student teachers who have developed a high sense of self-efficacy will behave in a manner that will make them efficacious teachers (Plourde, 2002).

Beyond pre-service preparation, in-service participation improves teacher efficacy (Brownell & Pajares, 1999; Telljohann, Everett, Durgin, & Price, 1996; Watson, 2006). In-service education should enhance teacher knowledge and skills in an effort to improve their effectiveness (Garton & Chung, 1996) and provide opportunities to improve their teaching abilities (Telljohann et al.). Not surprisingly, in-service participation directly affects a teacher's self-efficacy and self-perceived success when working with students with special needs (Brownell & Pajares).

The third area impacting teacher efficacy is administrative support (Brownell & Pajares, 1999). The educational leadership and support of administrators contributes to teachers' commitment to the profession (Colardarci, 1994). In fact, Brownell & Pajares suggested supportive administrators increase teacher efficacy. This increase in efficacy may increase teacher perseverance.

If pre-service preparation, in-service participation and administrative support have enhanced the efficacy of some teachers, will these factors also be predictive of the self perceived success of secondary agriculture teachers? Secondary agriculture teachers face the challenge of teaching students with special needs and diverse student learners. However, do agriculture teachers feel prepared to teach students with special needs? Do teachers perceive they are successful in teaching students with special needs? Do differences exist between pre-service requirements for teaching students with special needs? Will the teaching efficacy for a state which requires specialized coursework be different than the efficacy of teachers from a state that does not require specific coursework for teaching students with special needs? Addressing these questions may shed light on an important topic in agricultural education.

Purpose and Research Objectives

The purpose of this study was to examine and compare the self-perceived success in working with students with special needs of beginning agriculture teachers between two states with different certification requirements. Missouri requires specialized coursework for working with students with special needs, while North Carolina does not require specialized coursework. More specifically, Missouri requires a minimum of two semester hours of coursework devoted to students with special needs for teacher licensure. North Carolina teaching licensure does not require coursework which addresses students with special needs. The following research objectives were constructed to guide the study:

1. Compare the personal and professional characteristics of teachers (age, sex, years of teaching experience, teacher licensure, and level of education).
2. Compare teachers' assessment of their teacher preparation program, in-service programs, and administrator's general support toward working with students with special needs.
3. Compare teacher efficacy toward the competencies necessary for working with students with special needs.
4. Compare the self-perceived success of teachers when working with students with special needs.
5. Compare the explained variance in self-perceived success of working with students with special needs accounted for by teacher efficacy while controlling for teacher preparation, administrative support, and in-service participation.

Methods and Procedures

This descriptive study utilized an on-line questionnaire to survey beginning agriculture teachers in two states. The self efficacy of Missouri's beginning agriculture teachers who were

required to complete special education coursework was compared to the level of efficacy held by beginning agriculture teachers in North Carolina who were not required to complete specific coursework. Four variables were investigated in the study: 1) teachers' perception of their teacher preparation program, 2) perception of in-service participation, 3) administrative support and 4) self-efficacy toward teaching students who possess special needs. These variables were assessed to investigate factors influencing a teacher's self-efficacy when working with students with special needs, as well as their influence on teachers' self-perceived success. Finally, the factors influencing teacher efficacy and the overall self-perceived success were compared between the selected states.

The target population included 123 beginning agriculture teachers in Missouri with five or less years of teaching experience and 115 beginning agriculture teachers in North Carolina with similar experience. No sampling procedures were employed as the entire population meeting the criterion were included in this study. The population frame was developed using the *Missouri Agriculture Teacher Directory and the North Carolina Agriculture Teacher Directory.* These directories included all persons teaching agriculture in each of the selected states, as well as their years of teaching experience. These references were considered reliable to construct the frame, as they were maintained by the Missouri Department of Elementary and Secondary Education and the North Carolina Department of Public Instruction, respectfully.

The data collection instrument used was a modified version of *Working with Diverse Students: The General Educator's Perspective* (Brownell & Pajares, 1999) Modifications were made to the original questionnaire by removing demographic questions which did not address the objectives of this study. The questionnaire was validated through prior research (Bandura, 1993; Billingsley, Pyecha, Smith-Davis, Murray, & Hendricks, 1995; Morvant & Gersten, 1991; Rosenholtz, 1989) and was assessed for reliability with teachers in the state of Florida (Brownell & Pajares). Cronbach's alpha coefficients were reported for each section of the questionnaire and ranged from .81 to .96. Additionally, post-hoc reliability was calculated and ranged from .78 to .97 for Missouri and .70 to .97 for North Carolina. Overall reliability was estimated to be .93 for Missouri and .93 for North Carolina.

The questionnaire was administered to the teachers through an on-line survey tool. To ensure the results of the study were representative of the population, non-response error was addressed. Miller and Smith (1983) stated that late respondents are often similar to non-respondents. Therefore respondents were categorized into separate groups of early and late respondents and compared for statistical differences (Ary, Jacobs, & Razavieh, 2002).

Descriptive statistics were used to simplify and characterize the data. Pearson product correlation coefficients were calculated between variables and interpreted using Bartz's (1999) descriptors. In addition, hierarchical multiple linear regression was used to explain the variance in beginning agriculture teachers' self-perceived success of working with students with special needs, while controlling for the variables of interest.

Results and Findings

After appropriate follow-up procedures were employed (Dilman, 2007), 81 of the 123 (66%) beginning agriculture teachers in Missouri and 69 of the 105 (66%) beginning agriculture teachers in North Carolina returned useable questionnaires. Respondents were categorized into separate groups of on-time and late respondents, individuals who replied after the third request, and compared for statistical differences (Ary, Jacobs, & Razavieh, 2002). The variances were assumed equal after calculating Levene's test for equality of variances ($p > .05$). The independent samples *t*-test for Missouri showed no significant difference between on-time ($n = 48$) and late respondents ($n = 25$) for teacher preparation ($t = .04$; $p > .05$), in-service ($t = -1.65$; $p > .05$), administrative support ($t = -1.76$; $p > .05$), self-efficacy ($t = -1.82$ $p > .05$) and perceived success ($t = -.02$: $p > .05$). Similarly, independent samples *t*-tests for North Carolina failed to show significant difference between on-time and late respondents for teacher preparation ($t = .09$; $p > .05$), in-service ($t = -1.99$; $p > .05$), administrative support ($t = .16$; $p > .05$), self-efficacy ($t = -.02$ $p > .05$) and perceived success ($t = 1.29$: $p > .05$).

The first research objective sought to describe teachers on their personal and professional characteristics. The respondents from Missouri and North Carolina were found to be nearly equally split between males ($n_1 = 42$; $n_2 = 36$) and females ($n_1 = 39$; $n_2 = 33$) (see Table 1). In addition, the most frequent level of education for both states was found to be a bachelor's degree. On average, respondents from Missouri had 2.71 years of teaching experience and were approximately 26 years of age, ranging from 22 to 48. Beginning agriculture teachers in North Carolina averaged 27 years of age and ranged in age from 22 to 63. The average length of teaching experience for North Carolina was 2.5 years.

Table 1
Characteristics of Beginning Agriculture Teachers ($n_1 = 80$; $n_2 = 69$)

	Missouri ($n_1 = 80$)			North Carolina ($n_2 = 69$)		
Construct Items:	*%*	Mean	*SD*	%	*Mean*	*SD*
Age		26.10	4.00		26.70	6.70
Years of Teaching		2.70	1.50		2.50	1.30
Sex						
Female	48.00			47.80		
Male	52.00			52.20		
Teacher Licensure						
University preparation	95.10			89.90		
Temporary certificate	4.90			10.10		
Educational Level						
Bachelors	80.20			60.90		
Masters	19.80			39.10		

The second research objective sought to compare teachers' assessment of their teacher preparation program, in-service programs, and administrator's general support toward working with students with special needs. First, beginning agriculture teachers assessed their teacher preparation program. Individual items in this construct consisted of questions such as

"knowledge of the different needs of student with disabilities" and "ability to manage the behavioral difficulties of students with disabilities." Missouri's beginning agriculture teachers overall (summated) assessment of their pre-service coursework regarding working with students with special needs was 3.57 (*SD* = 1.22) (see Table 2). The summated assessment of North Carolina's beginning agriculture teachers was 3.44 (*SD* = 1.11).

Table 2
Perceptions of Working With Students With Special Needs;

	Missouri (n_1 = 80)		North Carolina (n_2 = 69)	
Construct Items:	Mean	*SD*	Mean	*SD*
Teacher Preparation [a]	3.57	1.22	3.44	1.11
In-Service Participation [a]	3.36	1.45	3.42	1.44
Administrative Support [a]	4.66	1.16	4.20	1.20
Self Efficacy [b]	4.31	.72	4.11	.84
Self Perceived Success	4.72	.90	4.59	.87

Note. a Scale: 1 = disagree, 6 = agree. b Scale: 1 = nothing, 6 = a great deal

Next, participants were asked their level of agreement in response to the statement "I have actively participated in staff development programs in my school or district that focus on…" The statements included examples of in-service opportunities which addressed students with special needs. Descriptive statistics were calculated for perceptions of in-service participation for each of the four construct items, followed by a summated score. The overall assessment of the in-service participation for beginning agriculture teachers was 3.36 (*SD* = 1.51) for Missouri and 3.42 (*SD* = 1.44) for North Carolina (see Table 2).

Research objective two also sought to assess teacher's perception of general administrative support. Administrator support was measured using twelve individual items. Respondents ranked their level of agreement with statements such as "supports me in my interaction with parents," "informs me about school/district policies" and "supports general educators in mainstreaming students with disabilities." The summated score for Missouri's general administrative support was 4.66 (*SD* = 1.16) (see Table 2), while North Carolina's teachers indicated an average of 4.20 (*SD* = 1.20) for administrative support.

Comparing teacher efficacy toward the competencies necessary for working with students with special needs was the purpose of research objective three. According to the theoretical framework offered by Brownell & Pajares (1999), self efficacy is one factor of self-perceived success. Self efficacy ascertains the beliefs teachers hold about their ability to teach students. Teachers were asked to respond to the question: "considering your current instructional situation and teaching responsibilities, how much can you do to…" Eleven items defined the construct and included items such as "keep students with learning problems on task during difficult assignments" and "individualize learning for students with learning problems." The teacher efficacy of Missouri's beginning agriculture teachers' summated score was 4.31 (*SD* = 0.72) (see Table 2). The teaching efficacy of beginning agriculture teachers in North Carolina was determined to have a summate score of 4.11 (*SD* = .84).

Describing the self-perceived success of beginning agriculture teachers' ability to teach students with special needs was the purpose of the fourth research objective. Self-perceived

success evaluated the actual success teachers have experienced. Construct items included statements such as "special education students have been successfully included in my classroom" and "I have successfully taught students with learning problems." Beginning agriculture teachers in Missouri reported their self-perceived success toward teaching students who possess special needs (*M* = 4.72, *SD* = .90) (see Table 2). The mean score for beginning agriculture teachers in North Carolina was 4.59 (*SD* = .87).

To address research objective five, a hierarchical regression analysis was calculated. Prior to conducting the regression analysis an intercorrelation matrix was generated to reveal the presence of multicollinearity (see Tables 3 & 4). The bivariate correlations between the three control variables posed no threat of multicollinearity (Berry & Feldman, 1985). In addition, multicollinerarity was also examined through the tolerance values.

Table 3
Intercorrelation Matrix Missouri

Variable	X^1	X^2	X^3	X^4	Y
Teacher Preparation $(X)^1$	1.00	.24	.36	.47	.35
Administrative Support $(X)^2$		1.00	.24	.18	.09
In-service $(X)^3$			1.00	.45	.23
Teacher Efficacy $(X)^4$				1.00	.51
Self-Perceived Success (Y)					1.00

For Missouri, teacher preparation (*r* =.35) and in-service participation (*r* = .23) were determined to have low and positive relationships with the dependent variable, self-perceived success of teaching students with special needs. The relationship between administrative support and self-perceived success for Missouri was determined to be positive and very low (*r* = .09). A moderate and positive relationship occurred between self-efficacy and perceived success of working with students with special needs (*r* = .51) for Missouri respondents.

North Carolina respondents indicated pre-service preparation (*r* =.22), administrative support (*r* =.29), and in-service participation (*r* =.30) had low and positive relationships with the dependent variable, self-perceived success of teaching students with special needs. North Carolina was determined to have a moderate and positive relationship between self-efficacy and perceived success of working with students with special needs (*r* =.62).

Table 4
Intercorrelation Matrix North Carolina

Variable	X^1	X^2	X^3	X^4	Y
Teacher Preparation $(X)^1$	1.00	.20	.26	.26	.22
Administrative Support $(X)^2$		1.00	.17	.32	.29
In-service $(X)^3$			1.00	.25	.30
Teacher Efficacy $(X)^4$				1.00	.62

Self-Perceived Success (Y)	1.00

Table 5
Hierarchical Regression of Self-Perceived Success on Control Variables and Teacher Efficacy Missouri (n = 81)

Variable	R^2	R^2 *Change*	*b*	*t*	*p*
Control Variables					
Administrator Support	.13	.13	-.01	-.10	.92
Teacher Preparation			.22	2.52	.01*
In-service Programs			.08	1.06	.30
Variable of Interest					
Teacher Efficacy	.27	.14	.58	3.81	.01
(Constant)			2.00		

Note. [a]Control variables included administrator support, teacher preparation, and in-service programs.
**p < .05*

The control variables of administrative support, pre-service preparation, and in-service programs were entered first and together accounted for 13% of the variance in self-perceived success of working with students with special needs for Missouri (see Table 5). When the variable of interest, teacher efficacy, was added to the control variables, 27% of the variance in self-perceived success of working with students with special needs could be explained. For Missouri, teacher efficacy accounted for 14% of the variance in teacher's perceived success of working with students of special needs, beyond the contribution of teacher preparation, administrator support, and in-service participation.

For North Carolina, administrator support, pre-service preparation, and in-service programs accounted for 15% of the variance in self-perceived success of working with students with special needs (see Table 6). When teacher efficacy was added to the control variables, 40% of the variance in self-perceived success of working with students with special needs could be explained. For North Carolina, teacher efficacy uniquely accounted for 25% of the variance in teacher's perceived success of working with students of special needs.

Table 6
Hierarchical Regression of Self-Perceived Success on Control Variables and Teacher Efficacy North Carolina(n = 69)

Variable	R^2	R^2 *Change*	*b*	*t*	*p*
Control Variables					
Administrator Support	.15	.15	.05	.63	.53
Teacher Preparation			.07	.75	.46
In-service Programs			.05	.73	.47
Variable of Interest					
Teacher Efficacy	.40	.25	.55	4.93	.01
(Constant)			1.55		

Note. [a]Control variables included administrator support, teacher preparation, and in-service programs.
*$p < .05$

Conclusions and Recommendations

Beginning agriculture teachers in Missouri and North Carolina are similar in their years of teaching experience, sex, education level, and pre-service preparation programs. Slight differences were seen in the pre-service programs reported by participants in the two states. For example, five percent of the beginning agriculture teachers in Missouri reported holding a temporary certificate, while ten percent of the respondents in North Carolina held a temporary certificate.

When the four teacher perceptions areas were examined, including perceptions of their preparation, in-service participation, administrative support, and self-efficacy, administrative support contributed the greatest to teaching students with special needs for both Missouri and North Carolina. These finding suggest beginning agriculture teachers perceive administrators as generally supportive of their efforts to assist students, including students with special needs. In addition, the findings for administrative support approached the findings of Brownell & Pajares (1999), who found administrative general support to have a mean of 4.82. However, participants in this study had a much lower level of agreement on the in-service construct. In-service participation focusing on students with special needs contributed the least to self perceived success for both states. The findings of this study indicate limited in-service participation for in-service activities which addressed students with special needs. This finding supports the research by Brownell & Pajares. In-service participation addressing teaching students with special needs in the context of agriculture education may be lacking. However, do agriculture teachers perceive the need for additional in-service training focused on students with special needs? Is there a difference between the quantity of in-service opportunities which address students with special needs and the actual participation reported by agricultural teachers? Telljohann et al. (1996) found health education in-service programs increased teachers' efficacy. Could this also be found in agricultural education? If beginning agriculture teachers were able to participate in additional in-service activities focusing specifically on working with students with special needs, would their teacher efficacy also increase?

Beginning agriculture teachers in both states varied in their perceptions of teacher preparation program's ability to address teaching students with special needs. Previous research by Brownell & Pajares found less level of agreement of teachers' perceived pre-service preparation for teaching students with special needs. However, these findings are consistent with the related findings of Rieck (1992), who examined pre-service preparation in working with students with special needs. Rieck suggested nearly two-thirds of pre-service programs graduated students inadequately prepared to work with students with special needs. Slightly differences exist between Missouri, which requires coursework in teaching students with special needs, and North Carolina, which does not require specific coursework in this area. However, there is little practical difference in the perceptions of beginning secondary agriculture teachers in the selected states. The varied response to pre-service preparations may be a concern for agricultural educators.

In general, beginning teachers reported some success in teaching students with special needs, illustrated by their perceived self-efficacy and self-perceived success, in both states. Findings indicate high self-efficacy than the previous research of Brownell & Pajares. This finding supports a study of student teachers in the southeastern United States that found to be adequately confident when teaching students with special needs (Kessell et al., 2006). However this finding contrasts the results of Rieck's (1992) study of pre-service programs. Would the level of perceived success compare to a measured competency for teaching students with special needs?

Teacher preparation, administrator's general support, in-service participation and teacher efficacy explained more of the variance in self-perceived success for North Carolina. However, the variables of teacher preparation, administrator support, and in-service programs accounted for approximately the same amount of variance in Missouri and North Carolina's beginning agriculture teachers' self-perceived success of working with students with special needs. The percent of variance in self-perceive success account for by self-efficacy was substantially different between the two states. Self-efficacy for North Carolina respondents explained approximately twice the amount of variance in self-perceived success as that accounted for by the self-efficacy of respondents from Missouri.

This finding supports prior research where teacher efficacy had a pronounced effect on elementary school teacher's self-perceived success (Brownell & Pajares, 1999). What factors, besides required coursework for working with students with special needs, exist between these two states which might account for the vast difference in the variance in self-perceived success? What additional factors contribute to the self-perceived success of secondary agriculture teachers?

Much of the variance in self-perceived success of working with students with special needs is still unknown and should be the goal of future research efforts if we are to effectively teach all agricultural education students. The hands-on, practical experience students in agricultural education programs may be a factor for enrollment in agriculture classes by students with special needs. Agriculture teachers must be equipped to teach these diverse learners. The variance in self-perceived success of beginning agriculture teachers when working with students with special needs should be examined in other states. With the number of alternatively certified teachers increasing, new questions arise for their perceived success in working with students with special needs. Research should be conducted to determine the most effective method for increasing teacher efficacy concerning working with students with special needs. In addition, the self-perceived success of experienced agriculture teachers when instructing students with special needs may also be the subject of future research. Beginning agriculture teachers expressed a limited amount of participation in in-service programs focusing on working with students with special needs, suggesting additional in-service opportunities and participation may be beneficial.

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