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Secondary agricultural teacher self-efficacy in agribusiness and the relationship to collegiate course work

William Michael Vestal

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Secondary agricultural teacher self-efficacy in agribusiness and the relationship to collegiate
course work

By

William Michael Vestal

A Dissertation
Submitted to the Faculty of
Mississippi State University
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy
in Agricultural Science (Agricultural and Extension Education)
in the School of Human Sciences

Mississippi State, Mississippi

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2019

Secondary agricultural teacher self-efficacy in agribusiness and the relationship to collegiate
course work

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A study was conducted to determine the relationship between agribusiness self-efficacy and business related collegiate courses. One hundred eleven ($N = 111$) Mississippi and Tennessee secondary agricultural education teachers completed a researcher developed survey that measured agribusiness self-efficacy using 88 competencies from Mississippi and Tennessee secondary agribusiness courses. Participants rated their confidence to teach each competency using a 5 point scale with 1 as no confidence and 5 as very confident. The survey also assessed the types and number of collegiate-level business related courses completed by the participants as well as other demographic factors. Multiple linear regression, ANOVA, and Spearman's rho tests were used to assess relationships between the measured agribusiness self-efficacy and the various demographic factors. The mean agribusiness self-efficacy was 3.18 ($SD = 0.788$) indicating that teachers are only somewhat confident to teach agribusiness. Factor analysis divided the 88 competencies into nine themes. The overall competency and nine factor competency means were used as dependent variables. Marketing and introductory agribusiness courses loaded on most of the regression models. The number of collegiate business related courses is significantly related to participants agribusiness self-efficacy. Participants with a high

GPA were found to have a significantly lower agribusiness self-efficacy as compare to lesser GPA groups. Teaching agribusiness courses increases agribusiness self-efficacy. Utilizing agribusiness textbooks and guest speakers also increases agribusiness self-efficacy. Owning a business was included in most of the agribusiness self-efficacy models. Nine of the ten regression models solely included state department of education facilitated agribusiness professional development. Years of experience was only significantly related to one of the ten dependent variables. No significant relationship was discovered between agribusiness self-efficacy and teacher age. No significant differences in agribusiness self-efficacy was discovered for education level, college major, certification type. It is recommended that universities include a marketing course along with an introductory to agribusiness course to prepare pre-service agricultural education teachers. It is also recommended that secondary agricultural education teachers maintain a professional library with agribusiness textbooks and to utilize guest speakers as needed to optimize agribusiness self-efficacy.

Key words: self-efficacy, agribusiness, collegiate course

DEDICATION

I dedicate this dissertation to Emily who has inspired me to reach for the stars since we met in graduate school at Mississippi State. I am truly blessed by having you in my life.

I also dedicate this dissertation my parents, Billy and Carol, for their support and encouragement to achieve my goals. Thank you for giving me the means to accomplish great things.

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To Dr. Kirk Swortzel, thank you for your service as my committee chair and major professor. I am grateful for your guidance throughout the process. Working with a graduate student who lives three hours away must have been difficult, but you made it seem easy. Thank you for allowing me the opportunity to complete my formal education at Mississippi State.

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To the secondary agricultural education teachers across Mississippi and Tennessee, thank you for participating in my study. Thank you for preparing our future agricultural leaders.

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CHAPTER I

INTRODUCTION

Agricultural education classes offered at the secondary school level provide students with opportunities to learn about the production of food and fiber and how those resources move from the producer to the consumer. Courses in agricultural education may include areas such as plant science, animal science, agricultural mechanics and engineering, biotechnology, natural resources and environmental science, agribusiness, and food processing. Students learn both technical and soft skills in agricultural education programs that can be utilized throughout their life (National Council for Agricultural Education, 2015).

Following the lead of the National Council for Agricultural Education (2015), state agricultural education leaders have developed curriculum similar to college majors where students complete a sequence of courses in a specific area of the agricultural industry instead of a generalized approach. These specialized areas are known as career pathways (MDOE, 2017) or programs of study (TDOE, 2017). The agricultural education career pathways in Tennessee are veterinary and animal science, agricultural engineering and applied technologies, agribusiness, food science, horticulture science, and environmental and natural resource management (TDOE, 2017). Mississippi's agricultural education career pathways are agricultural and environmental science and technology, agricultural and natural resources, agricultural power and machinery, food products, forestry, and horticulture (MDOE, 2017).

The study of agribusiness concepts and principles has always been an important topic throughout agricultural education. Agribusiness education is the study of economic and business principles as they relate to agriculture (Talbert, Vaughn, Croom, & Lee, 2014). Courses in agribusiness education prepare students for a wide variety of careers by teaching students finance, marketing, management, economics, leadership, and communication. The study of agribusiness can occur in standalone courses or can be integrated as smaller units into other agricultural education courses (TDOE, 2017). Tennessee has an Agribusiness career pathway (TDOE, 2017); Mississippi has agribusiness courses as part of the Agricultural and Environmental Science and Technology (AEST) pathway. However, elements of agribusiness education can be found throughout the agricultural education curriculum regardless of the course or career pathway in Mississippi and Tennessee.

Agribusiness topics can increase financial literacy (National Council for Agricultural Education, 2015), which has become an issue in the United States (Crow, 2015). The National Financial Capability Study (FINRA, 2017) found that 63% of United States citizens were unable to score higher than 60% on a financially literacy quiz. Two-thirds of young adults in the United States did not have a basic understanding of financial literacy in areas such as inflation, risk management, and interest rates (Gale, Harris, & Levine, 2012). Many people lack the skills to distinguish between the numerous retirement, saving, and credit options available (Hastings, Madrian, & Skimmyhorn, 2013). Due to findings such as these and the causes and effects of the recession of late 2000s, financial education is one tool in increasing the public's financially literacy (Hastings et al., 2013). The goal of agribusiness education is to teach students economic, business, and financial principals so they can apply that knowledge throughout their future (TDOE, 2017).

Teachers must have confidence in order to teach students. Teacher confidence is positively linked to effective teaching strategies, classroom management, teaching well-being, and job satisfaction (Collie, Shapka, & Perry, 2012). Teachers, or any other individuals, will more likely participate in activities that they high confidence and less likely in areas of low confidence (Bandura, 1994). If teachers lack confidence in a subject, then they are more likely avoid teaching the subject if given a choice. Teachers could exhibit decreased classroom performance if they are required to teach the subject matter that they lack confidence.

The concept of teacher confidence is also known as teacher self-efficacy. Bandura (1994) defined self-efficacy as “people’s beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives” (p. 71). A person’s self-efficacy influences their motivation and behavior (Bandura, 1994). Teacher self-efficacy is positively related to job satisfaction and classroom performance and is negatively related to teacher stress (Collie et al., 2012). Teachers who have a high self-efficacy level have students with higher motivation to learn and achieve (Klassen & Chiu, 2010).

Even though research in agricultural teacher self-efficacy is increasing, the focus of agricultural teacher self-efficacy has concentrated on career commitment, agricultural mechanics and engineering, and mathematics (McKim & Velez, 2016). While there have been studies in teacher self-efficacy on specific agricultural subject areas, limited teacher self-efficacy studies have been conducted in the subject of agribusiness. An increased understanding of teacher agribusiness self-efficacy will provide school leaders, policy makers, and secondary agricultural education teachers the knowledge to optimize agribusiness education while developing curriculum, selecting proper coursework, and providing professional development. High self-efficacy levels would suggest teachers are more effective at teaching agribusiness standards.

Low self-efficacy levels would suggest that teachers need additional training to optimize agribusiness education.

Statement of the Problem

Agricultural education has a diverse yet integrated curriculum. Agricultural education programs are becoming more specialized emphasizing pathways in agribusiness, animal science, plant science, environmental and natural resources, food science, and agricultural engineering and technology. Yet, even as agricultural education program specialization is occurring, concepts from all areas of agriculture can be included in all agricultural education courses.

This is especially true for agribusiness concepts, which is included in all three phases of the agricultural education: the classroom, FFA, and experiential learning. Marketing, risk management, record keeping, financial management, and decision making are all agribusiness concepts that could be included in all agricultural education courses. Teaching students how to construct a bill of materials in agricultural mechanics, select a bull based on visual inspection as well as price and potential offspring in animal science, the benefits and drawbacks of selling a crop immediately after harvest or storing it for future sale in plant science, the costs associated with producing traditional versus organic vegetables in food science, and the process of establishing a fishing guide service in environmental science are just a few of the many ways that teachers can emphasize agribusiness concepts in non-agribusiness courses.

The National FFA Organization has educational events such as marketing plan, agricultural sales, and farm and agribusiness management that have a direct relationship with agribusiness. The National FFA Organization also includes agribusiness topics in the areas of agricultural technology and mechanics, forestry, nursery/landscape, as well as many other areas. In experiential learning, teachers supervise students to assist them in maintaining current and

non-current inventories, utilizing various record keeping systems, managing assets and liabilities, calculating depreciation, planning risk management strategies, developing budgets, and completing balance sheets throughout their experience. Teachers also instruct students in the area of agribusiness when they assist them in completing FFA Proficiency Award, State FFA Degree, and American FFA Degree applications, which are based partly on students' experiential financial and management experience.

Agribusiness skills and competencies can be transferred to all agricultural education program areas (TDOE, 2017). These skills can be utilized by students not only in future agricultural careers but in other career fields as well (TDOE, 2017). Once teacher agribusiness self-efficacy is determined, school leaders, universities, and other educational professionals can develop programs as needed to optimize agribusiness instruction.

Colleges and universities are challenged with selecting the optimal courses for preservice agricultural education teachers to take with the limited number of hours available (Duncan, Ricketts, Peake, & Uessler, 2006). Preservice agricultural education programs typically provide a generalized educational approach because they need to prepare students for a wide range of possible future teaching positions. With a limited number of hours for undergraduate education, it is difficult to provide a preservice teacher with all the skills and knowledge they would possibly need as an agricultural teacher (Duncan et al., 2006).

Research has shown that teacher self-efficacy in agricultural mechanics is related to the number of agricultural mechanics courses completed (Byrd, Anderson, Paulsen, & Shultz, 2015). No research has been published relating the number of collegiate-level agribusiness courses with teacher self-efficacy in providing students with agribusiness education. Current teachers should assess their agribusiness self-efficacy and relate it to the coursework they completed at the

collegiate level. Certain types of agribusiness or business-related courses might be related to teacher agribusiness self-efficacy similar to Byrd et al. (2015) study of agricultural mechanics. Colleges, universities, state departments of education, and other professional development organizations would benefit from the knowledge of teacher agribusiness self-efficacy as well as if that confidence is related to collegiate coursework. These groups could develop preservice and in-service programs to increase teacher agribusiness self-efficacy if a relationship exists.

Purpose of the Study

The purpose of this study was to determine agricultural teacher self-efficacy based on Mississippi and Tennessee agricultural education standards developed from the Agribusiness Systems Career Pathway of the National Agriculture, Food, and Natural Resources Career Cluster Content Standards (2015). The study also examined if teacher agribusiness self-efficacy was related to such as coursework completed in college, years of experience, age, post-secondary major, post-secondary grade point average, type of teacher certification (alternate vs. traditional), highest degree completed, secondary agricultural courses taught, business related occupation experiences, professional development participation, and resources available to teach agribusiness.

Research Objectives

The following research objectives accomplished the purpose of the study:

1. Identify demographic information such as coursework completed in college, years of experience, post-secondary major, post-secondary grade point, average, type of teacher certification (alternate vs. traditional), highest degree completed, secondary

- agricultural courses taught, business related occupational experiences, professional development attended, and resources available to teach agribusiness.
2. Determine major agribusiness themes using Mississippi and Tennessee agricultural education state competencies.
 3. Determine the teacher self-efficacy of Mississippi and Tennessee secondary agricultural education teachers for teaching agribusiness.
 4. Discover if a relationship existed between teacher agribusiness self-efficacy and various demographic characteristics.

Significance of the Study

Determining teacher confidence to teach agribusiness competencies could lead to changes in how universities and educational leaders prepare and equip teachers in order to optimize classroom performance. If teachers lack confidence to teach the agribusiness competencies, actions could be taken by educational leaders to offset the lack of confidence.

Factor analysis will reveal common agribusiness competency themes. These themes could provide insight into which agribusiness concepts teachers are the most confident. Likewise, results could reveal themes where teachers lack confidence. Mississippi and Tennessee agricultural education leaders can concentrate their actions on competencies associated with themes with lower self-efficacy.

The comparison of teacher agribusiness self-efficacy across the various demographics could reveal groups that are significantly different based on their confidence to teach agribusiness competencies. If certain collegiate courses are related to high self-efficacy, then colleges can adapt the required coursework during teacher preservice training. If a particular instructional resource reveals higher levels of self-efficacy, then local administrators can equip

teachers with those resources. The study will not only examine total teacher agribusiness self-efficacy but will also examine if demographics indicate differences for each of the possible themes. Depending on the results of the study, teachers can determine which experiences to participate in to increase agribusiness competency teaching confidence.

While the study is not generalizable outside of Mississippi and Tennessee, the study will likely increase awareness into agribusiness teacher self-efficacy as well as generate discussion into agribusiness and other agricultural subject content self-efficacy. With increased awareness, policymakers will emphasize how agribusiness standards benefit agricultural students as well as increase financial literacy among teenagers.

Definitions

Agribusiness – “the manufacture and distribution of farm supplies to the production agriculturist, and the storage, processing, marketing, transporting, and distribution, of agricultural materials and consumer products that were produced by production agriculturists” (Ricketts & Ricketts, 2009, p. 537),

Agribusiness education – the study of economic and business principles as they relate to agriculture (Talbert et al., 2014),

Agricultural economics – “an applied social science with how humans choose to use technical knowledge and scarce resources such as land, labor, capital, and management to produce food and fiber and to distribute agricultural commodities and products from consumption to various members of society over time” (Ricketts & Ricketts, 2009, p. 537),

Alternative certification – teacher certification pathway for individuals who have not completed an educationally related (teaching) degree at a traditional university or college (Robinson & Edwards, 2012),

Career pathway – an education program that consists of structured courses that prepares students for career in a particular industry (Rowland, 2013); MDOE refers to career pathways as “programs of study”; TDOE refers to career pathways as “career clusters”,

Competency – a statement that details the knowledge, skills, or behavior of person who has completed a course or program (Hartel & Foegeding, 2004),

FFA – intracurricular youth organization for students enrolled in agricultural education courses; also known as the Future Farmers of America (Phipps, Osborne, Dyer, & Ball, 2008),

Self-efficacy – judgments about one’s ability to organize and produce certain outcomes (Bandura, 1997); also known as confidence (Akhtar, 2008),

Standards – knowledge that a student should possess at the completion of a lesson, course, or career pathway (Talbert et al., 2014),

Teacher self-efficacy – a teacher’s “judgement of his or her capabilities to bring about desired outcomes of student engagement and learning” (Collie, Shapka, & Perry, 2012, p. 2),

Traditional certification – type of teacher certification for individuals who complete an educationally related (teaching) degree at a traditional university or college (Robinson & Edwards, 2012).

Limitations

The following were limitations for this study:

1. The results cannot be generalized beyond the study area due to the sample consisting only of agricultural education teachers from Mississippi and Tennessee.
2. An instrument was created to assess teacher agribusiness self-efficacy. Bias can exist in research-created instruments.
3. Agricultural education teachers self-reported information for the study. Self-reported data can lead to selective memory and exaggeration.
4. Limited research exists concerning teacher self-efficacy for agricultural content knowledge.
5. The descriptive correlational design of the study limits the opportunity to determine a cause and effect relationship.
6. Participants reported self-efficacy using a 5 point scale.

Assumptions

The following were assumptions were made for this study:

1. Participants completed the survey honestly and to the best of their ability.
2. Participants were able to comprehend the competencies and standards used in the survey.

The comprehension of self-efficacy levels was consistent across the participants.

CHAPTER II

LITERATURE REVIEW

The review of literature examines various aspects of secondary agricultural education and the study of teacher self-efficacy for teaching agribusiness standards. The review begins defining agribusiness followed by the historical development of the agricultural education curriculum. Teacher self-efficacy and its relationships to teacher experience, age, collegiate coursework, education experience, business related occupational experience, teacher certification, and professional development were also examined. Social Cognitive Theory is the theoretical framework for this study.

Historical Development of Agricultural Education Curriculum

Agricultural education in the United States has changed dramatically since its beginnings. Originally, agricultural education consisted of informal community gatherings where farmers met to discuss new techniques on how to grow crops and raise animals. Agricultural education began to become more formalized with the passage of the Morrill Act of 1862, establishing of land-grant universities with the purpose of agricultural, military, and mechanical arts education and research (Sternberg, 2014).

Public perception for secondary agricultural education grew throughout the nation but differed from state to state. In the 1820s, Maine passed legislation providing funds to assist the Gardiner Lyceum, a small community school that emphasized agriculture in the curriculum (Talbert, et al., 2014). Massachusetts was one of the first states to pass legislation in 1862

encouraging youth participation in agriculture instruction (National Research Council, 1988). In 1891, Tennessee enacted legislation requiring that all secondary schools to teach principles of agriculture (National Research Council, 1988). Connecticut, Rhode Island, and New Hampshire were some of the first states to provide funding to establish agricultural schools operated by the state. Alabama later established regional agricultural schools in 1897, and Wisconsin was the first state to provide counties with funds for local agricultural education programs (National Research Council, 1988).

The federal government passed two major pieces of legislations that enhanced agricultural education. The Nelson Amendment to the Morrill Act, passed in 1907, provided federal funds for land grant universities to train teachers in agricultural education (National Research Council, 1988). The Smith-Hughes Act of 1917 provided federal funds to local school systems to provide agricultural education. The Smith-Hughes Act also changed secondary agricultural education from a general to vocational approach (National Research Council, 1988). Prior to the passage of the Smith-Hughes Act, local systems would emphasize how science relates to agriculture over the occupational aspects of the industry to serve the students who planned to move away from the farm as well as those who planned to remain (National Research Council, 1988).

Early secondary agricultural curricula included science and vocational based education. Curricula consisted of agronomy, farm mechanics, and animal husbandry through laboratory and field work. Early secondary agricultural education focused beyond its goal of the Smith-Hughes Act to train potential farmers. The inclusion of science principles allowed agricultural education to make general education topics relevant to everyday life. Vocational agriculture teachers promoted research and the use of innovations to enhance agricultural production and reduce

long-standing problems. Agricultural education promoted higher order thinking through a mixture of classroom instruction, hands-on laboratory experience, and real-world entrepreneurial experience (National Research Council, 1988). At the 1909 Convention of Association of American Agricultural Colleges and Experiment States, A.C. True stated “the standard agricultural courses, whether in ordinary high schools or in special schools, should not be narrowly vocational, but should aim to fit the pupils for life as progressive, broad-minded, and intelligent men and women, citizens and homemakers, as well as farmers and horticulturists” (Allen, 1909, p. 508). The inclusion of traditional subject matter using agricultural concepts led to development of today’s agricultural education.

Secondary agricultural education changed with the passage of the Vocational Education Act of 1963. This act, which replaced the Smith-Hughes Act of 1917, removed specified funding for secondary agricultural education and placed funding decisions with the states (Talbert et al., 2014). Without the federal mandate, states could decide how much funds each vocational program would receive. Even though the intent was to expand experiential learning opportunities, many states reduced emphasis on Supervised Agricultural Experience programs when the Vocational Education Act of 1963 no longer required supervised on-the-farm practice (Talbert et al., 2014).

One of the greatest impacts that the Vocational Education Act of 1963 had on secondary agricultural education was how vocational agriculture was viewed. From 1917 to the mid-1960s, vocational agriculture education concentrated in preparing students to become the future farmers that our society needed (Brister, 2008). The Vocational Education Act of 1963 expanded secondary agricultural education to include all areas of agriculture, not just production agriculture. With the passage of this act, agribusiness and agriscience was added to the

agricultural education curriculum (Blassingame, 1999). The inclusion of business and science related to agriculture was intended to move vocational agriculture away from simply training potential farmers to developing agricultural leaders.

Agricultural education went through a crisis in the 1970s and early 1980s. Agricultural education programs saw decreases in enrollment and availability during this time period. From 1975 to 1981, agricultural education enrollment decreased about 20% while other vocational education programs increased enrollment by 10% or more. Agricultural education courses and curriculum generally were developed at the local level and primarily consisted of production agriculture topics (National Research Council, 1988).

Major changes occurred in agricultural education during the 1980s to reverse the decreased enrollment and availability. The Future Farmers of America began operating as the National FFA Organization and changed its creed, awards, and structure to promote the diversity of agriculture beyond farming (National FFA, 2016). State departments of education began assisting local school systems to increase the quality of instruction (National Research Council, 1988). States also worked with local school systems, land-grant and other agricultural universities, and agricultural industries to modernize the curriculum to include science, business, technology, mathematics, and social sciences in the context of the dynamic agricultural industry (National Research Council, 1988).

Another 1980s educational reform that affected agricultural education was the promotion of standards based education. In 1983, *A Nation at Risk* suggested increasing standards and accountability in education (USDE, 2008). Federal legislation, such as *Goals 2000: Educate America Act of 1994*, *Improving America's Schools Act of 1994*, and *No Child Left Behind Act of 2001*, resulted in states developing clearer standards that were grade specific and academically

challenging (USDE, 2008). Standards based education is a major part of Common Core (Barton, 2009). In 2009, the National Council for Agricultural Education published standards for agricultural education to assist states and local systems in developing curriculums and state standards (National Council for Agricultural Education, 2015). Standards based education moved curriculum decisions from the individual teacher to state departments of education.

In recent years, some state and local school districts have pushed for career and technical education programs to become specialized (Burris et al., 2010). Today, agricultural education programs are geared towards providing a sequence of courses to prepare students for a specific career pathway or program of study (TDOE, 2015).

Today, agricultural education programs prepare students for a variety of careers in areas such as animal science, agribusiness, plant science, natural resource management, and agricultural engineering (TDOE, 2015). Agricultural education not only prepares students to enter the workforce directly after high school but also prepares students to attend post-secondary educational programs (National Council for Agricultural Education, 2015).

Agriculture, Food, and Natural Resources Career Cluster Content Standards

The National Council for Agricultural Education, also known as the The Council, developed the Agriculture, Food, and Natural Resources Career Cluster Content Standards to provide state and local agricultural education leaders and teachers guidance in developing higher order, relevant, and appropriate agricultural education curriculum (National Council of Agricultural Education, 2015). Just as agriculture is diverse across the United States, The Council recognized that agricultural education programs were just as diverse. Therefore, The Council encouraged state departments of education and local agricultural education teachers to use the standards as one tool to assist advisory councils in the development of the agricultural

education curriculum (National Council of Agricultural Education, 2015). The overall goal of the Agriculture, Food, and Natural Resources Career Cluster Content Standards is to continue our nation’s agricultural strength by preparing students with the skills they need as they move from the school to the workforce (National Council of Agricultural Education, 2009).

The development of the Agriculture, Food, and Natural Resources Career Cluster Content Standards began in 2003 as part of the United States Department of Education Clusters Project and the National FFA 10X15 Project. The original standards were developed by 257 secondary and post-secondary agricultural leaders and 155 agricultural industry representatives. The original Agriculture, Food, and Natural Resources Career Cluster Content Standards were published in 2009 (National Council for Agricultural Education, 2009). The Council began a revision process in 2014 to maintain relevance of the standards within the dynamic agricultural industry. This process included 270 secondary and post-secondary career and technical education leaders and business and industry leaders. The revised standards were published in 2015. Both documents, original and revision, were developed using a multiphase process to ensure relevance and rigor (National Council for Agricultural Education, 2015).

The Agriculture, Food, and Natural Resources Career Cluster Content Standards include ten categories: Career Ready Practices, Cluster Skills, and eight Career Pathways. The Career Ready Practices standards promote responsibility, decision making, critical thinking, leadership as well as many other basic skills and practices needed in students’ future careers. The Cluster Skills section includes standards relating to fundamental agricultural knowledge and skills needed throughout the agricultural industry. The eight Career Pathways standards provide state and local agricultural educators in depth direction with technical content requirements needed for future success in each of the individual pathways. The eight Career Pathways are Agribusiness

Systems, Animal Systems, Biotechnology Systems, Environmental Service Systems, Food Products and Processing Systems, Natural Resource Systems, Plant Systems, and Power, Structural and Technical Systems. Each category is included as part of the Common Career and Technical Core Standards. The Agriculture, Food, and Natural Resources Career Cluster Content Standards have been reviewed to provide crosswalks with national academic standards in the areas of Common Core English Language Arts, Common Core Mathematics, Next Generation Science Standards, Green/Sustainability Knowledge and Skill Statements, and National Standards for Financial Literacy (National Council for Agricultural Education, 2015).

The Agriculture, Food, and Natural Resources Career Cluster Content Standards are organized by three levels. The Standards level includes general knowledge that students should possess at the completion of a program of study in a particular pathway. The Performance Indicators level serves as precise statements to indicate the acceptable performance level students should possess at completion of a course of study within the career cluster. The Sample Measurements level consists of measurable activities which students would conduct in order to demonstrate proficiency of the Performance Indicators. The listed Sample Measurements throughout the Agriculture, Food, and Natural Resources Career Cluster Content Standards are designed to be viewed as suggested, not required, activities. Each Performance Indicator has multiple Sample Measurements based on three levels of proficiency, awareness, intermediate, and advanced (National Council for Agricultural Education, 2015).

Agribusiness Education

Lessons in agribusiness topics are needed by young farmers, ranchers, and agricultural leaders (Bailey, Arnold, & Igo, 2014; Suvedi, Jeong, & Coombs, 2010). Agribusiness courses had the second fewest number of secondary students (Figure 1) and were offered in the second

fewest number of programs (Table 1) during the 2017-2018 academic year in Tennessee (TDOE, 2019). Mississippi does not have a separate agribusiness career pathway, but does offer two courses, Science of Agribusiness Level I and Level II, as part of the Agricultural and Environmental Science and Technology pathway. It is unknown how often agricultural teachers integrate agribusiness lessons into non-agribusiness courses.

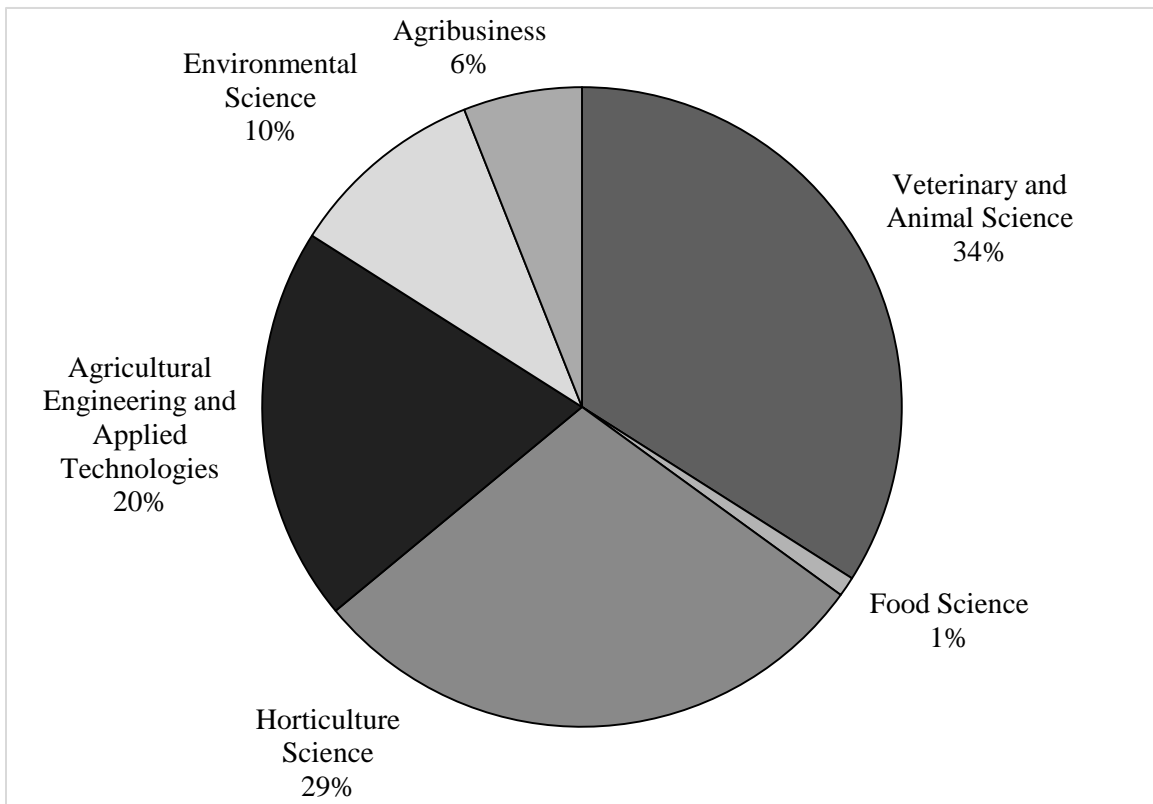


Figure 1 2017–2018 Student Enrollment in Tennessee Secondary Agricultural Education Courses by Program of Study (TDOE, 2019)

Table 1 Number of Tennessee Secondary Agricultural Education Programs Offering Program of Studies in 2017–2018

Program of Study	Number of Programs
Horticulture Science	142
Veterinary and Animal Science	141
Agricultural Engineering and Applied Technologies	110
Environmental and Natural Resource Management	74
Agribusiness	47
Food Science	12

Teacher Self-Efficacy

Teacher self-efficacy is a complex issue that is not easily defined and is difficult to understand (Burriss et al., 2010). Bandura (1994) defined self-efficacy as “people’s beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives” (p. 71). Gibson and Dembo (1984) defined teacher efficacy as multidimensional factor with personal teacher efficacy being a teacher’s ability to influence student learning and general teaching efficacy being a teacher’s ability to control the learning environment in spite of outside forces such as socioeconomic status and school conditions. Collie, Shapka, and Perry (2012) stated teacher self-efficacy is “judgement of his or her capabilities to bring about desired outcomes of student engagement and learning” (p. 2).

Teacher efficacy refers to the capability of a teacher, not the intent of the teacher. Teacher self-efficacy is the teacher’s belief that they can achieve the objective (Collie et al., 2012). The study of teacher efficacy is concentrated on if the teacher can complete the objective instead of will they complete the objective (Klassen & Chiu, 2010).

Today, the study of teacher self-efficacy can be focused in overall teacher self-efficacy or into more specific terms such as self-efficacy in classroom management, self-efficacy in content knowledge, self-efficacy in student engagement, self-efficacy in instructional strategies as well

as other topics (Collie et al. 2012). Even though the definition of teacher self-efficacy has evolved over the years, the key concept remains. Teacher self-efficacy involves a teacher's belief in their capability to educate students.

Teacher self-efficacy has been determined to influence several important educational factors. Student motivation and achievement are positively associated with teacher self-efficacy (Klassen & Chiu, 2010). Teachers with higher teacher self-efficacy tend to try harder with more persistence leading to better classroom performance (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998). Teacher self-efficacy is positively linked to effective teaching strategies, classroom management, teaching well-being, and job satisfaction (Collie et al., 2012). High teacher self-efficacy has been associated with lower teacher stress (Klassen & Chiu, 2010). Career persistence and teacher self-efficacy demonstrate a positive relationship (McKim & Velez, 2016). With reduced stress, increased job satisfaction, and better classroom performance, high teacher self-efficacy can be used to predict highly effective teachers who are less likely to leave the profession (Collie et al., 2012).

Teacher self-efficacy can be measured at the preservice level as well. Blackburn, Robinson, and Field (2015) surveyed students' self-efficacy on 11 objectives in a welding course. The students' initial self-efficacy scores were positively related to their final grade. College students with higher self-efficacy ratings typically have higher levels classroom performance and commitment to excellence (Chemers, Hu, & Garcia, 2001). Student teaching is an opportunity for pre-service teachers to develop their teacher self-efficacy (McKim & Velez, 2016). Determining a person's self-efficacy is one indicator of potential success.

Even though teacher self-efficacy is typically positively related to teacher performance, some research suggests this is not always true. Stripling and Roberts (2012) assessed preservice

teachers' self-efficacy and actual ability in mathematics. The preservice teachers reported a high level of mathematics teaching self-efficacy and a moderate level of personal mathematics self-efficacy. However, preservice teachers scored low on mathematics ability, leading to a negative relationship between self-efficacy and performance. Scales, Terry, and Torres (2009) conducted a similar study with agricultural teachers and science. Teachers in the study reported a high level of teacher self-efficacy regarding scientific concepts. When assessed with a standardized biological examination, only 10% of the agricultural education teachers received a proficient score or higher.

Limited research has been conducted regarding teacher content knowledge self-efficacy in agricultural education (McKim & Velez, 2016). This is especially true regarding in agribusiness. Burris et al. (2010) examined first and fifth-year agricultural education teachers in Texas to self-assess their ability to teach five content areas of agricultural education. First-year agricultural teachers cited they were most confident in teaching animal science objectives and least confident in teaching agricultural mechanics and technology. Fifth-year teachers believed their strongest area was animal science and their weakest area was environmental science followed closely by plant and soil science. Agribusiness was rated as the second strongest content area by both first and fifth-year teachers. Both groups rated themselves at a moderate level for agribusiness self-efficacy. This study determined overall teacher self-efficacy for general agricultural education content areas. It did not determine teacher self-efficacy for specific standards. Little work has been conducted to determine agricultural teacher self-efficacy in the area of agribusiness content standards.

Years of Experience

Teacher self-efficacy is strongly influenced by years of teaching experience (Burriss et al., 2010). Huberman (1989) describes The Teacher Career Cycle Model (Figure 2) where actions, effectiveness, and perceptions change as teachers advance in their career. According to the study, a teacher's early years are spent on discovery and survival in the classroom. During the middle stage of the model, teachers tend to experiment more with their lessons leading to stabilization of methodology. Teachers in the final stage of the model tend to be less likely to learn new strategies as they are preparing for life after the classroom. Studies have found that teacher self-efficacy alters through the different stages of The Teacher Career Cycle Model (Burriss et al., 2010). Career longevity and teacher self-efficacy is positively related (McKim & Velez, 2016).

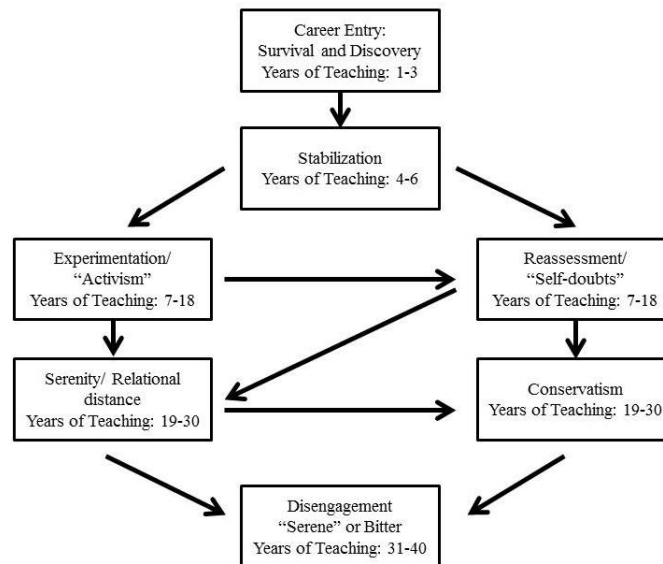


Figure 2 Huberman Teacher Career Cycle Model

(Huberman, 1989)

Even though research suggests teacher self-efficacy varies among years of experience, research differs of when teacher self-efficacy is the highest. Fifth-year Texas agricultural education teachers assessed their self-efficacy at a higher rate compared to first-year Texas agricultural education teachers (Burriss et al., 2010). Burriss et al. (2010) cited that teacher self-efficacy increases during preservice training but decreases once a teacher enters actual teaching experiences. Similarly, teacher self-efficacy is believed to be most influenced and malleable during the early stages of a teacher's career (Tcshannen-Moran & Woolfok Hoy, 2007). Tcshannen-Moran & Woolfok Hoy (2007) also stated that novice teachers (less than four years of experience) have a significantly lower teacher self-efficacy than experienced teachers (four or more years of experience). Klassen and Chiu (2010) found that teacher self-efficacy increased during the first 23 years but decreased after the 23rd year, which is consistent with Huberman's Teacher Career Cycle Model. Conversely, Watters and Ginns (1995) suggest that teacher self-efficacy will be influenced more from learning experiences than from teaching experiences. The differences in findings may result from how teacher self-efficacy is measured, how teacher self-efficacy is defined, when teacher self-efficacy was measured during the study (Burriss et al., 2010). Also, teachers with low teacher self-efficacy could leave the profession due to lower job satisfaction.

Research suggests that teacher self-efficacy is related to years of experience. Yet, most research in agricultural education self-efficacy has been concentrated on preservice teachers (Rubenstein, Andrew, & Thorn, 2014; Stripling & Roberts, 2012; Krysher, Robinson, Montgomery, & Edwards, 2012) or teachers in their first five years of teaching (McKim & Velez, 2015; Robinson & Edwards, 2012; Swan, Wolf, & Cano, 2011; Wolf, 2011; Burriss et al.,

2010). McKim and Velez (2016) concluded that additional research in agricultural education should be conducted beyond the beginning stages of a teaching career.

Age

Age is normally not a variable in teacher self-efficacy studies because research suggests age and teacher self-efficacy are not related (Colomeishi & Colomeishi, 2014; Penrose, Perry, & Ball, 2007; Tschannen-Moran & Woolfolk Hoy, 2007; & Bandura, 1994). Bandura (1994) stated that efficacy would not correlate with age because individuals experience many pathways through life and people vary in how they use efficacy to manage their lives. However, Coladarci and Breton (1997) did discover older resource teachers exhibited a slightly higher teacher efficacy as compared to younger resource teachers. Gungo and Ozdemir (2017) discovered a significant difference between age groups and teacher self-efficacy among teachers enrolled in a pedagogical formation program.

Prior Coursework Completed (Type and Number)

Agricultural teacher education programs are challenged with creating the optimal program of study to prepare secondary agricultural education teachers. Teacher preparation programs face ongoing challenges such as aligning with current technological trends (Rojewski, 2002) and changing career competencies (Duncan et al., 2006). The complication is multiplied for agricultural education programs as they must prepare future teachers in the multiple areas such as animal science, agricultural engineering, plant science, agribusiness, and beyond (Burriss et al., 2010). It is important to select the optimal program of study because subject matter knowledge is an important trait of effective teachers (Roberts & Dyer, 2004).

Courses taken during preservice training can impact teacher self-efficacy. Tschannen-Moran & Woolfolk Hoy (2007) found that teachers can alter their teacher self-efficacy the greatest during preservice training by preparing themselves with the proper coursework. Similarly, Watters and Ginns (1995) suggested that teacher self-efficacy is influenced by learning experiences, such as types of college courses completed. McKim and Velez (2017) found significant correlations between preservice coursework and classroom management, leadership, science teaching, and math teaching self-efficacies among agricultural education teachers with one to five years of teaching experience. Stripling and Roberts (2012) discovered that preservice agricultural education teachers who took advanced mathematics courses in high school and college performed better on basic mathematics ability tests as compared to preservice teachers who only took basic or intermediate mathematics courses. A relationship did exist between the number and types of agricultural mechanics courses completed (Byrd, Anderson, Paulsen, & Shultz, 2015). However, researchers cited that a threshold could exist after two agricultural mechanics courses. Even though specific content self-efficacy might increase, overall self-efficacy may not increase after the threshold is reached (Byrd et al., 2015).

Education Level

Secondary agricultural education teachers differ in collegiate experiences such as highest level of education, major at the undergraduate and graduate levels, and grade point average (GPA). Most researchers have concluded that level of education does not affect a teacher's self-efficacy (Gungor & Ozdemir, 2017; Guenther, 2014; Sture, 2014; Tschannen-Moran & Johnson, 2011) even though completing degrees involves mastering skills which is the strongest self-efficacy influencer (Bandura, 1994). However, Alrefaei (2015) discovered that teacher self-efficacy did statistically differ between educational levels of fifth grade science and math

teachers in Arkansas. Furthermore, teachers with bachelor's degrees had a higher total teacher self-efficacy than teachers with master's degrees (Alrefaei, 2015).

Collegiate Major

Colleges and universities are limited by the number of courses that they require for completion of each major. Professors, administrators, and stakeholders work to ensure that students have completed the optimum coursework within their major in order to be successful in their future careers. Limited research was found comparing teacher self-efficacy and collegiate major. Crook (2016) concluded that teacher self-efficacy was not significantly different between English as a Second Language (ESL) teachers with English majors and ESL teachers with non-English majors in Thailand. Evans (2010) found that even though major influenced mathematical content knowledge, teacher self-efficacy was not influenced by collegiate major. No literature was found comparing teacher self-efficacy and college major in the area of agricultural education or agribusiness.

Grade Point Average

Several studies have been conducted with comparing self-efficacy and academic success using GPA. Academic self-efficacy is correlated to academic achievement (Brown, Peterson, & Yao, 2016). Lambert (2007) found that self-efficacy was one of four factors that could predict self-reported GPA. Spicer (2017) attempted to create a prediction model using General Self-Efficacy Scale scores as one of three predictors of GPA. The overall model was not a good fit and self-efficacy was not found to be an individual predictor of GPA. Studies have also found that self-efficacy is a mediator between another variable and GPA (Temper & Yourstone, 2017;

Hen & Goroshit, 2014). While self-efficacy has been studied to be a predictor of GPA, no research was discovered using GPA as a predictor of teacher self-efficacy.

Certification Type

A demand exists for secondary agricultural education teachers as well as other areas of primary and secondary education. The demand is due in part to a high teacher turnover rate (Robinson & Edwards, 2012) and veteran teacher retirement (Fox & Peters, 2013). Four-year universities, who have traditionally prepared and certified teachers, have struggled to meet the teacher shortage demand (Steadman & Simmons, 2007). To meet the demand, local and state education leaders have begun to implement alternative certification programs (Robinson & Edwards, 2012).

Research is inconclusive regarding generalized differences in teacher self-efficacy based on certification type exist. Duncan and Ricketts (2008) found that traditionally certified teachers in Georgia had significantly higher self-efficacy ratings in technical content, program management, and FFA, SAE, and leadership development as compared to alternatively certified teachers. Teacher self-efficacy is dependent on the type of certification program that a teacher completes (Flores, Desjean-Perrotta, & Steinmetz, 2004). Roberts and Edwards (2012) concluded that alternatively certified first year teachers had a greater positive change in teacher self-efficacy as compared to traditionally certified first year teachers in Oklahoma. Fox and Peters (2013) could not conclude that teacher self-efficacy differed based on certification type of first year teachers. Furthermore, teachers in the study indicated that experience and teacher mentoring positively influences teacher self-efficacy (Fox & Peters, 2013). Rocca and Washburn (2005) concluded that lack of teacher self-efficacy differences between certification

types was because traditionally certified teachers being more critical of themselves due to an increased pedagogical understanding.

Professional Development

Teachers continue to increase their content knowledge, enhance their teaching methodology, and familiarize themselves with new teaching strategies outside the collegiate setting. Participating in professional development opportunities at the local, regional, state, and national level are methods in which teachers participate regularly to develop their teaching skills. Professional development is the most effective method of promoting education change and can lead to furthering student success (Shoulders & Myers, 2014). Secondary agricultural education teachers need regular professional development to acquire knowledge and skills to adapt to changing education policies as well as prepare students for a dynamic agricultural workforce (Sorenson, Tarpley, & Warnick, 2010).

Studies in professional development needs suggest that teachers desire more training in the area of agribusiness (Duncan et al., 2006). Agricultural education teachers believed that lessons promoting entrepreneurship should be included into the agricultural education curriculum but felt that they need more training in order to incorporate it properly (Dollisso, 2010). The need for agribusiness collegiate coursework and professional development has been discovered outside of educational research with young farmers requesting more professional development in agribusiness (Bailey, Arnold, & Igo, 2014; Suvedi, Jeong, & Coombs, 2010). However, Tennessee teachers self-reported that professional development to enhance teaching agricultural courses were among the lowest need (Sanok, Stripline, Stephens, Ricketts, Estep, & Conner, 2015). Of the 85 possible items that Tennessee teachers reported a professional development need, professional development in the area of teaching individual agricultural education courses,

such as Agricultural Economics and Livestock Management, were 26 of the lowest 28 items scored.

Professional development has been linked to teacher self-efficacy. Watson (2006) found that professional development increases a teacher's self-efficacy. Intense summer programs have been found to increase teacher self-efficacy more than a one-time professional development workshop (Watson, 2006). Ulmer, Velez, Lambert, Thompson, Burris, and Witt (2013) discovered that secondary agricultural teachers who participated in the CASE institute, an intense professional development program designed to increase secondary agricultural education teacher's science and mathematics teaching skills, had increases in personal science teaching efficacy, which remained high nine months after the conclusion of the program. Tschannen-Moran and McMaster (2009) concluded professional programs that included mastery experience or follow-up coaching increased a teacher's self-efficacy.

Subjects (Classes) Taught

Teacher self-efficacy can be subject matter specific (Tschannen-Moran, Woolfolk Hoy, & Hoy (1998). According to Tschannen-Moran, Woolfolk Hoy, and Hoy (1998), a teacher may have a high teacher efficacy rating in one subject area and a low rating in another, e.g. high in agribusiness and low in veterinary science. Secondary agricultural education teachers in Texas differed in content self-efficacy among the agricultural education pathways (Burris et al., 2010). Ross, Cousins, Gadalla, and Hannay (1999) found that content self-efficacy was lower when teachers taught subjects outside their normal subject area. Teachers should be allowed to concentrate in the areas where they have high teacher self-efficacy to maximize teacher effectiveness and seek out professional development in areas that they have low teacher self-efficacy to increase their confidence in those areas.

Resource Availability

The availability of resources also impacts teacher self-efficacy (Morris, 2017; Tschannen-Moran & Johnson, 2011). Teachers seek out additional resources when they are asked to teach subjects where they have low teacher self-efficacy (Ross et al., 1999). Resource availability has a greater impact on teacher self-efficacy in mathematics and science than it does in language arts and social sciences (Morris, 2017). The effects of resource availability impacts novice teacher's self-efficacy more than experienced teachers (Tschannen-Moran & Hoy, 2007). Chester and Beaudin (1996) warns to not overwhelm new teachers with excess resources without proper training and support because it can offset the gains in teacher self-efficacy. School systems should provide adequate resources to teachers to optimize the teacher's self-efficacy which impacts teacher effectiveness.

Business Related Occupational Experience

No literature was found concerning non-educational occupational experiences and teacher self-efficacy, especially in the teacher agribusiness self-efficacy and a teacher's experience in a business related profession. Alternatively certified teachers could have occupational experience outside of education, but research into differences between certification types do not account for traditionally certified teachers obtaining occupational experience before or during their career. Participating in additional experiences could alter a person's self-efficacy. Research should be conducted to determine how occupational experiences outside of education might impact teacher self-efficacy.

Theoretical Framework

Social cognitive theory, developed by Albert Bandura, serves as the theoretical framework for this study. Originally termed social learning theory, Bandura changed the name to social cognitive theory in 1986 (Bandura, 2011). This was done to distinguish Bandura's theory from other theories that were being deemed as social learning theories. Also, Bandura (2011) wanted to acknowledge how social cognitive theory includes both how people obtain skills and knowledge as well as how people are motivated and regulated their behavior.

The social portion of the theory recognizes human actions within society, and the cognitive aspect acknowledges how cognitive processes influence human motivation and action (Bandura, 2011). According to social cognitive theory, human behavior, personal characteristics, and environmental factors are linked by a triadically reciprocal interaction (Figure 3; Bandura, 2011). The triadical reciprocation indicates that each factor has influence over the other two factors.

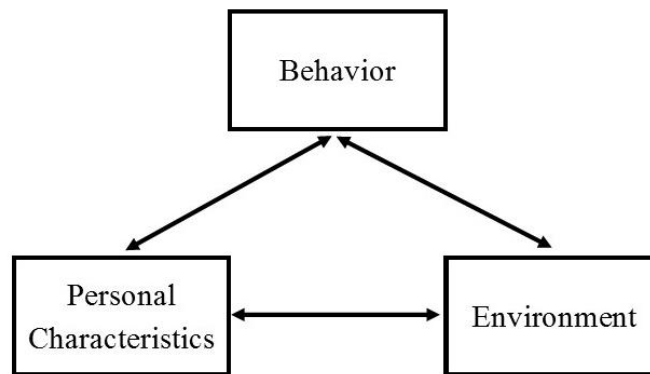


Figure 3 Social Cognitive Theory
(Bandura, 2011)

The concept of self-efficacy was derived from social cognitive theory (Bandura, 2011). Bandura (1994) defined self-efficacy as “people’s beliefs about their capabilities to produce effects” (p. 71). Bandura and Adams (1977) wrote “self-efficacy affects people's choice of activities and behavioral settings, how much effort they expend, and how long they will persist in the face of obstacles and aversive experiences” (pp. 287-288).

Self-efficacy beliefs determine how people are motivated, they feel, they think, and behave (Bandura, 1994). Often an individual’s motivation and action are based less on what is objectively true and more on what they believe to be true (Bandura, 1997). Individuals are more likely to participate in activities that they have a high self-efficacy and avoid tasks where they have low self-efficacy (Bandura, 1994). Teachers will work harder, set challenging goals, outcome setbacks quicker, and persist longer if they have high self-efficacy. Conversely, teachers will avoid tasks, have low aspirations, have weak commitment, and become stressed when they have low self-efficacy (Bandura, 1994). Bandura (1994) noted that an individual’s self-efficacy does change in life, but these changes are not stages which everyone has to pass. Changes in self-efficacy depend on emotional, physical, and cognitive development, environment situations, and personal experiences (Bandura, 1994).

Four factors lead to self-efficacy (Bandura, 1994). Mastery of experience is the strongest factor and is when an individual successfully or unsuccessfully completes a task. Vicarious experiences are when an individual observes another person successfully or failing completing a task. Social persuasion is when others provide positive or negative feedback concerning someone’s ability to complete a task (Bandura, 1994). The final factor is physiological and emotional states (McKim & Velez, 2017). This factor relates to the internal state of emotions that a person has while completing a task.

Summary

Teachers with higher self-efficacy typically have higher motivated and achieving students, higher job satisfaction, lower work-related stress, better classroom management, and more effective teaching strategies. A high level of self-efficacy is a good indicator of personal ability and success. However, researchers and school leaders should consider that high self-efficacy does not always translate to educational effectiveness and should consider other variables as well.

Teacher self-efficacy is related to types of courses completed during preservice training. Teacher self-efficacy is most malleable at this phase of a teacher's career. The types of courses will influence a teacher's over self-efficacy as well as content self-efficacy. Content knowledge and self-efficacy has been linked to teacher success.

A review of literature indicated teacher self-efficacy is related to certain factors beyond collegiate courses and not related other factors. Teacher self-efficacy is related to subject matters taught, professional development experiences, GPA, and resource availability. Age and a teacher's highest level of education is not typically related to a teacher's self-efficacy based on literature review. Research on years of experience and certification type differs on their impact towards teacher self-efficacy. Limited to no research was discovered relating collegiate major and non-educational occupational experience with teacher self-efficacy.

Studies have been conducted to determine agricultural teacher self-efficacy in the areas of mathematics and science. Research has discovered first and fifth-year agricultural teacher self-efficacy in generalized content areas. General agribusiness teacher self-efficacy is related at a moderate level. No research exists to determine individual agribusiness standards teacher self-

efficacy as well as how collegiate course work and other factors relate to agribusiness teacher self-efficacy.

CHAPTER III

METHODS

Introduction

This chapter describes the methods and procedures used to conduct the study. It includes the research purpose and objectives, quantitative research design, population description, instrument description, variables used in the study, pilot study summary, and data collection procedures, control for response error, and data analysis procedures.

Purpose of the Study

The purpose of this study was to determine agricultural teacher self-efficacy based on Mississippi and Tennessee agricultural education standards developed from the Agribusiness Systems Career Pathway of the National Agriculture, Food, and Natural Resources Career Cluster Content Standards (2015). The study also examined if teacher agribusiness self-efficacy was related to such as coursework completed in college, years of experience, age, post-secondary major, post-secondary grade point average, type of teacher certification (alternate vs. traditional), highest degree completed, secondary agricultural courses taught, business related occupation experiences, professional development participation, and resources available to teach agribusiness.

Research Objectives

The study had the following research objectives:

1. Identify demographic information such as coursework completed in college, years of experience, post-secondary major, post-secondary grade point, average, type of teacher certification (alternate vs. traditional), highest degree completed, secondary agricultural courses taught, business related occupational experiences, professional development attended, and resources available to teach agribusiness.
2. Determine major agribusiness themes using Mississippi and Tennessee agricultural education state competencies.
3. Determine the teacher self-efficacy of Mississippi and Tennessee secondary agricultural education teachers for teaching agribusiness.
4. Discover if a relationship existed between teacher agribusiness self-efficacy and various demographic characteristics.

Research Design

A descriptive correlational research design utilizing cross-sectional survey techniques was used in this study. This method was chosen because the study only plans to determine if relationships exist with no attempt to determine the cause of the relationships (Fraenkel, Wallen, & Hyun, 2012). The descriptive portion of the design was selected to determine characteristics (agribusiness self-efficacy, collegiate coursework, highest level of education, undergraduate major, graduate major, undergraduate GPA, teacher certification type, subject matter taught, resource available, business related occupational experience, professional development experience, age, and years of experience) of secondary agricultural education teachers in Mississippi and Tennessee, and the correlational portion of the design will determine if

relationships exist between agribusiness self-efficacy and the remaining variables. There was no attempt to determine causal relationship between the variables. The advantages of this design are that it will provide current information about secondary agricultural education teachers in Mississippi and Tennessee and that relationships can be determined if they exist (Fraenkel et al., 2012). The disadvantage of this design is that the results cannot be used as causal reference (Fraenkel et al., 2012). Cross-sectional survey technique will be used because a predetermined population will be surveyed during one point in time (Fraenkel et al., 2012).

Study Population

The population for the study consisted of agricultural education teachers in Mississippi and Tennessee. These states were selected due to location and ease of obtaining contact information. The study included 139 Mississippi and 308 Tennessee secondary agricultural education teachers. The total number of secondary agricultural education teachers from Mississippi and Tennessee included in the study was 447.

Dependent Variables

Agribusiness Self-Efficacy –determined by calculating a mean of the participant’s agribusiness self-efficacy rating using Mississippi and Tennessee secondary agribusiness course competencies; divided into 10 sub-categories (*Overall Competency* and nine *Factor Means* from factor analysis as part of this study); scores range from 1 to 5 (1 = No Confidence, 2 = Little Confidence, 3 = Somewhat Confident, 4 = Confident, 5 = Very Confident)

Overall Competency – determined by calculating a mean of participant’s agribusiness self-efficacy rating on 88 Mississippi and Tennessee secondary agribusiness

course competencies; scores range from 1 to 5 (1 = No Confidence, 2 = Little Confidence, 3 = Somewhat Confident, 4 = Confident, 5 = Very Confident)

Factor Mean – determined by calculating a mean of participant’s agribusiness self-efficacy rating on Mississippi and Tennessee secondary course competencies associated with each factor determined from this study; scores range from 1 to 5 (1 = No Confidence, 2 = Little Confidence, 3 = Somewhat Confident, 4 = Confident, 5 = Very Confident)

Independent Variables

Collegiate Course Type – participants selected which types of collegiate level agribusiness and business related courses that completed at the undergraduate and graduate level (combined); choices included were Introduction to Agribusiness, Microeconomics, Macroeconomics, Marketing, Business Law, Management, Farm Management, Entrepreneurship, Accounting, Personal Finance, and Other Business Related Course; responses were coded as 1 = completed the course and 0 = did not complete the course

Collegiate Course Number – participants provided the total number of collegiate level agribusiness and business related courses that they completed at the undergraduate and graduate level (combined)

Education Level – participants selected their highest level of education that they had completed from a list; choices included were high school, associate degree, bachelor’s degree, master’s degree, educational specialist’s degree, and doctoral degree

College Major – participants selected which category best described their undergraduate and graduate major; undergraduate choices included were Agricultural Education, Agricultural Economics / Agribusiness, Plant Science with an emphasis in Horticulture, Plant Science with an emphasis in Agronomy, Animal Science, Agricultural Engineering, Natural Resource / Forestry / Wildlife Management, Other Agriculturally Related Major, Business / Economics (Non-Agricultural), Education (Non-Agricultural), Other Undergraduate Major, and No Undergraduate Degree; graduate choices included were Agricultural Education, Agricultural Economics / Agribusiness, Plant Science with an emphasis in Horticulture, Plant Science with an emphasis in Agronomy, Animal Science, Agricultural Engineering, Natural Resource / Forestry / Wildlife Management, Other Agriculturally Related Major, Business / Economics (Non-Agricultural), Education (Non-Agricultural) with an emphasis in Instruction / Curriculum / Teaching, Education (Non-Agricultural) with an emphasis in Administration / Leadership, Other Graduate Major, and No Graduate Degree

GPA – participants selected their undergraduate Grade Point Average (GPA) from a range of choices; choices included 3.50 – 4.00, 3.00 – 3.49, 2.50 – 2.99, and Less than 2.50

Certification Type – participants selected which type of teacher certification that they currently have; choices included traditional and alternative

Classes Taught – participants selected which types of secondary agricultural education classes or subjects that they have previously taught or are currently teaching; choices included were General Agriculture, Agriscience, Agribusiness, Animal

Science / Small Animal / Poultry / Livestock Management, Veterinary Science, Agronomy, Horticulture / Greenhouse Management / Nursery / Floriculture, Agricultural Engineering / Mechanics, Natural Resource / Forestry / Wildlife Management, Agricultural Leadership / Communications, and Other Agricultural Class / Subject; responses were coded as 1 = taught class and 0 = have not taught class

Resources – participants selected which types of resources they had available to teach agribusiness lessons; choices included agribusiness textbook, commercially developed agribusiness curriculum, classroom computer. access to a computer lab, business leaders available to serve as guest speakers, access to university extension resources, business leaders serving on an advisory council, other resources available, and no resources available; responses were coded as 1 = resource available and 0 = resource is not available

Business Experience – participants selected which types of business related occupational experience they have participated in during their career; choices include interning with a company, employed in a finance position, employed in a sales position, employed in a merchandizing position, employed in a marketing position, employed in a management position, owned and operated a personal business, own and operated a personal farm, other business related occupational experience, and no business related occupational experience; responses were coded as 1 = had the experience and 0 = did not have the experience

Professional Development – participants selected the sources of agribusiness or business related professional development that they have participated in during their

career; choices included were state department of education, USDE, state association of agricultural educators, NAAE, other professional organization or association, private industry, land grant university, non-land grant university, state department of agriculture, USDA, other source of agribusiness or business related professional development, and no agribusiness or business related professional development; responses were coded as 1 = participated in professional development from that source and 0 = have not participated in professional development from that source

Years of Experience – participants provided the total number of years that they have taught secondary agricultural education

Age – participants provided their age in years

Instrument

The survey instrument (Appendix B) was constructed to obtain teacher confidence ratings in agribusiness as well as various demographics. The first section of the survey consisted of state competencies from Mississippi and Tennessee secondary agribusiness courses. Student competencies were used from Mississippi's Science of Agribusiness Level I and Level II courses. Course standards were used from Tennessee's Principles of Agribusiness and Agricultural Business and Finance courses. The competency section consisted of 88 total items. Teachers rated their confidence in their ability to teach each indicator based on a five-point scale (*1 = No Confidence, 2 = Little Confidence, 3 = Somewhat Confident, 4 = Confident, 5 = Very Confident*).

The second section of the questionnaire consisted of demographic type questions concerning collegiate coursework, level of education, collegiate major, undergraduate GPA,

teacher certification type, agricultural subject matter taught, agribusiness resource availability, business related occupational experience, professional development experience, years of teaching experience, and teacher age.

Face and content validity of the survey was determined by a panel of experts consisting of Mississippi State University agricultural education and agricultural economics professors. A pilot test using 32 Alabama secondary agricultural education teachers was conducted for purpose of checking for internal consistency reliability. Cronbach's α was used to check for internal consistency reliability. The survey was also modified based on responses from the pilot study.

Pilot Study

Alabama secondary agricultural education teacher email addresses were obtained from the Alabama Department of Education Agricultural Education Division from Jacob Davis, Alabama State FFA Advisor, with permission to use for this study. Participation request emails were sent to 288 Alabama secondary agricultural education teachers through Qualtrics. Thirty two teachers completed the pilot survey (11.1% response rate).

Reliability analysis and exploratory factor analysis was conducted the *Agribusiness Self-Efficacy*. Reliability analysis resulted in a Cronbach's α of 0.988 for the 88 agribusiness competencies. Exploratory factor analysis was conducted on *Agribusiness Self-Efficacy* producing 13 factors. Table 2 summarizes Cronbach's α for each factor and the number of competencies loading per factor.

Table 2 Pilot Study Factor Analysis and Cronbach's α ($N = 32$)

Factor	Number of Competencies	Cronbach's α
Basic Agribusiness	9	0.952
Banking and Taxes	6	0.917
Cultural Differences	2	0.755
Agribusiness Applications	8	0.958
Personal Income	4	0.908
Human Resource and Ethics	8	0.938
Economics	5	0.911
Business Records and Risk	11	0.957
Global and National Issues	9	0.949
Legal Issues	4	0.838
Business Development	10	0.945
Sales and Marketing	9	0.960
Decision Making	3	0.807

Responses from pilot study participants were analyzed to improve the survey document. The survey was modified to include Business Law as a collegiate course option. Additional options for undergraduate and graduate major were added based on responses by the participants.

Data Collection

The study was administered to Mississippi and Tennessee secondary agricultural education teachers using Qualtrics. Teacher email addresses were obtained from the Mississippi Department of Education and Tennessee FFA Foundation with assistance from Dr. Kirk Swortzel, Mississippi State University Agricultural and Extension Education Professor, and Kelsey Rose, Tennessee FFA Foundation Executive Director. The email lists contained emails for 447 teachers, 139 from Mississippi and 308 from Tennessee. Surveys were administered using techniques suggested by Don Dillman's Tailored Design Method for Web Questionnaires and Implementation (Dillman, Smyth, & Christian, 2014). The initial email was sent on December 3, 2018 with reminder emails sent on December 10, 2018, December 18, 2018, January 7, 2019, and January 15, 2019. Data collection ended on January 22, 2019. One

hundred eleven ($N = 111$) secondary agricultural education teachers completed the survey, resulting in a 24.8% response rate. Table 3 illustrates survey response rate.

Table 3 Response Rate of the 447 Mississippi and Tennessee Secondary Agricultural Education Teachers Surveyed

Email Title	Date	Email Response	Cumulative Response	Cumulation Response Rate
Invitation Email	12/3/2018	32	32	7.2%
Reminder 1	12/10/2018	43	75	16.8%
Reminder 2	12/18/2018	22	97	21.7%
Reminder 3	1/7/2019	7	104	23.3%
Reminder 4	1/15/2019	7	111	24.8%

An incentive was offered to increase participation. Ten teachers who completed the survey were randomly selected to receive a \$50 Wal-Mart Gift Card. The drawing was held on February 22, 2019. The randomly selected teachers were emailed to obtain their mailing address.

Early vs. Late Response Rate Bias

Responses were analyzed to determine if participants differed based on when they completed the survey. Individuals who completed the survey prior to December 18, 2018 were classified as early respondents ($n = 75$), and individuals who completed the survey after December 17, 2018 were classified as late respondents ($n = 36$). Early and late responders did not statistically differ on *Agribusiness Self-Efficacy* variables, number of collegiate business related courses, years of experience, and age ($p > 0.01$) using independent *t*-tests. Pearson's chi square tests indicated that they two groups were similar in state Department of Education professional development ($p < 0.01$). Pearson's chi square tests indicate differences between early and late responders for options associated with *Collegiate Course Type*, *Collegiate Major*,

GPA, Education Level, Certification Type, Courses Taught, Resources, Business Experience, and the remaining professional development sources. The differences between groups found in the categorical variables limit the generalizability beyond this study.

Non-Response Bias

A random sample of non-respondents from each state were selected to complete a shortened version of the survey to control for possible non-response bias. Thirty five teachers were selected to account for 10% of 336 total non-respondents. The survey included teacher confidence rating on 10 randomly selected agribusiness course competencies and demographics concerning highest level of education completed, total number of business related courses completed in college, years of experience, and resource availability. The survey was sent to the sample on February 4, 2019 with reminders on February 7, 2019, February 13, 2019, February 17, 2019, February 20, 2019, and February 26, 2019. Eighteen individuals from the sample participated in the non-response bias survey ($n = 18$). The non-response group was compared to the study participants for the items included in the shortened survey. Differences between the non-response group and the study participants were not significantly different ($p > 0.01$) for the 10 selected agribusiness competencies, the number of collegiate business related courses completed, and years of experience using independent *t*-tests. Pearson's chi square analysis indicates differences between the groups for the *Resource Availability* variable. The differences in *Resource Availability* limits the generalizability of the results beyond this study.

Data Analysis

Data were analyzed using SPSS. Responses and data were reviewed prior to analysis. A *priori alpha* value was set at 0.05.

All assumptions were checked and transformed as needed. Outliers were defined as cases whose z-scores exceeded three standard deviations from the mean. Normality was checked using Shapiro-Wilk and confirmed by inspecting the histogram. Levene's test was used to determine the homogeneity of variance assumption. Linearity and homoscedasticity were checked by analyzing scatterplots. Durbin-Watson test was used in determining independence. Multicollinearity was assessed using VIF values.

Participants could select an "other" option in the *Collegiate Course Type*, *College Major*, *Classes Taught*, *Resources*, *Business Experience*, and *Professional Development* variables. The participants had the option of supplying additional comments when selecting other. The other option was classified as one item for analysis even if two or more teachers supplied the same written response. A list of written other responses is found in Appendix E.

Data analysis included univariate and multivariate techniques. Frequencies and percentages were determined for categorical variables. Means and standard deviations were calculated for continuous variables.

Factor analysis was conducted using the 88 agribusiness course competencies using principal components analysis and direct oblimin (oblique) rotation. The total number of factors were determined by Kaiser's criterion of 1. Agribusiness competencies were grouped using structural matrix correlations. Groups were named according the competencies that loaded on each factor.

An independent samples *t*-test was used determine if significant differences existed between the two groups of *Certification Type* for the *Agribusiness Self-Efficacy* variables.

ANOVA tests were used to determine if differences existed between the *Education Level*, *College Major*, and *GPA*, for the *Agribusiness Self-Efficacy* variables. Post hoc testing was

conducted as needed using Bonferroni if homogeneity of variance was confirmed. If the homogeneity of variance assumption of was violated, Brown-Forsythe F ratio was included, and post hoc testing was conducted as needed using Games-Howell. Additionally, if any group for the *Education Level*, *College Major*, *GPA*, and *Certification Type* variables included only one participant, a one-sample t test was conducted to determine if that participant was statistically similar to another logical group.

Multiple linear regression, using stepwise techniques, was used to determine the influences of *Collegiate Course Type*, *Classes Taught*, *Resources*, *Business Experience*, and *Professional Development* on the *Agribusiness Self-Efficacy* variables. This was done because secondary agricultural education teachers could be in multiple groups within those independent variables.

Correlations and were used to determine the relationships between *Agribusiness Self-Efficacy* variables to *Collegiate Course Number*, *Experience*, and *Age*.

Effect sizes were determined for the various statistical tests (Watson, 2018). Cohen's *d* was calculated for independent samples t-tests (small = 0.2, medium = 0.5, and large = 0.8).

ANOVA effect size was determined using η^2 (small = 0.01, medium = 0.06, and large = 0.14).

Cohen's *f* was calculated for multiple linear regression (small = 0.14, medium = 0.39, and large = 0.59). Correlations used coefficients to determine effect size (small = 0.1, medium = 0.3, and large = 0.5; Watson, 2018).

CHAPTER IV

RESULTS

Purpose of the Study

The purpose of this study was to determine agricultural teacher self-efficacy based on Mississippi and Tennessee agricultural education standards developed from the Agribusiness Systems Career Pathway of the National Agriculture, Food, and Natural Resources Career Cluster Content Standards (2015). The study also examined if teacher agribusiness self-efficacy is related to such as coursework completed in college, years of experience, age, post-secondary major, post-secondary grade point average, type of teacher certification (alternate vs. traditional), highest degree completed, secondary agricultural courses taught, business related occupation experiences, professional development participation, and resources available to teach agribusiness. Each research question will be analyzed, and the results reviewed.

Research Objective One (Demographics)

Identify demographic information such as coursework completed in college, years of experience, post-secondary major, post-secondary grade point, average, type of teacher certification (alternate vs. traditional), highest degree completed, secondary agricultural courses taught, business related occupational experiences, professional development attended, and resources available to teach agribusiness.

Collegiate Course Type

One hundred eight of the 111 participants completed at least one agribusiness or business related collegiate course at the undergraduate or graduate level. Three did not complete an agribusiness or business related course at the collegiate level. Introduction to Agribusiness (Agricultural Economics) was the most selected course with 93 secondary agricultural education teachers selecting the course option. Entrepreneurship was the least non-other course selected course option with ten participants indicating that they completed the course. Table 4 shows the frequencies and percentages for participants based on *Collegiate Course Type*.

Table 4 Agribusiness and Business Related Courses completed by Secondary Agricultural Education Teachers from Mississippi and Tennessee ($N = 111$)

Course	<i>f</i>	%
Introduction to Agribusiness	93	83.8
Farm Management	53	47.7
Macroeconomics	37	33.3
Microeconomics	36	32.4
Management	29	26.1
Marketing	28	25.2
Accounting	24	21.6
Business Law	23	20.7
Personal Finance	13	11.7
Finance	11	9.9
Entrepreneurship	10	9.0
Other Business Type Course	9	8.1

Number of Collegiate Courses

Collegiate Course Number assessed the total number of business related courses completed by the participants at the undergraduate and graduate level. Three teachers provided answers that were classified as non-usable responses (Case 1 – “Majored in Agribusiness”, Case

70 – “10+, and Case 98 – “Unsure, but my major was Agribusiness). These responses were removed from analysis. Six participants did not respond to the question, resulting in 102 respondents indicating how many agribusiness or business related courses completed at the collegiate level. On average, participants completed approximately five ($M = 4.68$, $SD = 5.45$) agribusiness or business related courses at the collegiate level. Three participants did not complete an agribusiness or business related course while in college, and one individual completed 36 business type courses ($Range = 0 - 36$). The median and mode for business related courses was three.

Education Level

All Mississippi and Tennessee secondary agricultural education teacher participants had completed at least a bachelor’s degree. Of the 111 participants, 58 Mississippi and Tennessee secondary agricultural education teachers had a bachelor’s degree as the highest level of education completed, 43 participants had a master’s degree as their highest level of education, and 9 participants had an educational specialist’s degree. Only one teacher indicated that they had completed a doctoral degree. Table 5 shows the frequencies and percentages for the participants’ *Education Level*.

Table 5 Highest Level of Education Completed by Agricultural Education Teachers ($N = 111$)

Degree	f	%
Bachelor’s	58	52.3
Master’s	43	38.7
Educational Specialist’s	9	8.1
Doctorate	1	0.9

College Major

Agricultural Education is the most common undergraduate major with 48 Mississippi and Tennessee secondary agricultural education teachers indicating it as their undergraduate major. No Mississippi or Tennessee secondary agricultural education teacher reported that they majored in Agricultural Engineering or Plant Science with an emphasis in Agronomy. The majority of the secondary agricultural education teachers (96.4%) majored in an agriculturally related area at the undergraduate level. Only four secondary agricultural education teachers (3.6%) indicate that they majored in a non-agriculturally related undergraduate area. Undergraduate major frequencies are presented in Table 6.

Table 6 Undergraduate College Major of Secondary Agricultural Education Teachers from Mississippi and Tennessee ($N = 111$)

Undergraduate Major	<i>f</i>	%
Agricultural Education	48	43.2
Animal Science	25	22.5
Agricultural Economics / Agribusiness	17	15.3
Natural Resource / Forestry / Wildlife Management	7	6.3
Plant Science with emphasis in Horticulture	5	4.5
Other Agricultural Related Major	5	4.5
Business / Economics (Non-Agricultural)	1	0.9
Education (Non-Agricultural)	1	0.9
Other (Non-Agricultural)	2	1.8

Sixty eight Mississippi and Tennessee secondary agricultural education teacher participants indicated they had a graduate major. Only 53 teachers responded with having above a bachelor's degree. The difference may be attributed to how the question was phrased, "Which of the following best describes your graduate major?" Teachers who are currently working

towards a graduate degree could have indicated their current major. The graduate *College Major* sample size is 68.

Agricultural Education was also the most common graduate major for the Mississippi or Tennessee secondary agricultural education teacher participants with 29 teachers majoring in Agricultural Education at the graduate level. Only 1 teacher reported that they majored in Plant Science with an emphasis in Agronomy. No participants majored in Agricultural Economics, Agricultural Engineering, Business / Economics, and Non-Agriculturally Related Other at the graduate level. The majority of the secondary agricultural education teachers (69.1%) majored in an agriculturally related area at the graduate level. The remaining secondary agricultural education teachers (30.9%) indicated that they majored Education. Frequencies for graduate *College Major* are found in Table 7.

Table 7 Graduate College Majors of Secondary Agricultural Education Teachers from Mississippi and Tennessee ($n = 68$)

Graduate Major	<i>f</i>	%
Agricultural Education	29	42.6
Animal Science	8	11.8
Natural Resource / Forestry / Wildlife Management	5	7.4
Plant Science with emphasis in Horticulture	2	2.9
Plant Science with emphasis Agronomy	1	1.5
Other Agricultural Related Major (Please Specify Major)	2	2.9
Education with emphasis in Administration / Leadership	13	19.1
Education with emphasis in Instruction / Curriculum / Teacher	8	11.8

Grade Point Average

Thirty-nine Mississippi and Tennessee secondary agricultural education teachers that participated in the study reported having an undergraduate GPA of over 3.50. Fifty participants indicated their undergraduate GPA was between 3.00 and 3.49. Twenty-one participants had an

undergraduate GPA from 2.50 to 2.99. Only one participant selected having a GPA below 2.50. GPA group frequencies and percentages are found in Table 8.

Table 8 GPA of Secondary Agricultural Education Teachers from Mississippi and Tennessee ($N = 111$)

GPA Range	f	%
3.50 – 4.0	39	35.1
3.00 – 3.49	50	45.1
2.50 – 2.99	21	18.9
Below 2.50	1	0.9

Certification Type

Sixty four (57.7%) of secondary agricultural education teacher participants had traditional teacher certification. Forty seven (42.3%) of the participants were alternatively certified.

Classes Taught

Most (91%) secondary agricultural education teachers in the study had taught an Agriscience class at least once during their career. Only six secondary agricultural education teachers reported they had taught a Food Science course, the least selected subject option. Agribusiness courses were taught by 33 participants. Table 9 shows the frequencies and percentages for *Classes Taught* by teachers in the study.

Table 9 Classes Taught by Secondary Agricultural Education Teachers from Mississippi and Tennessee ($N = 111$)

Class (Subject Area)	f	%
Agriscience	101	91.0
Animal Science	81	73.0
Natural Resource Management	57	51.4
Horticulture	56	50.5
General Agriculture	49	44.1
Agricultural Engineering	44	39.6
Leadership / Communications	42	37.8
Agronomy	40	36.0
Agribusiness	33	29.7
Veterinary Science	31	27.9
Food Science	6	5.4
Other Agricultural Education Subject	11	9.9

Resources

Most (96.3%) secondary agricultural education teachers in the study reported having at least one agribusiness resource available. A classroom computer was the most common resource with 82 secondary agricultural education teachers responding with at least one in their classroom for student use. Only 14 participants had a commercially developed agribusiness curriculum available to use as a resource. Four secondary agricultural education teachers reported having no resource available to teach agribusiness content. Table 10 shows the frequencies for the *Resource* variable.

Table 10 Agribusiness Instructional Resource Availability of Secondary Agricultural Education Teachers from Mississippi and Tennessee ($N = 111$)

Resource	<i>f</i>	%
Classroom Computer that a Student Can Access	82	73.9
Access to a Computer Lab	74	66.7
Business Leaders as Guest Speakers	69	62.2
University Extension	69	62.2
Agribusiness Textbook	63	56.8
Business Leaders Serving on Advisory Committee	50	45.0
Agribusiness Curriculum	14	12.6
Other Agribusiness Instructional Resource	3	2.7

Business Experience

Mississippi and Tennessee secondary agricultural education teacher provided demographics concerning business related occupational experiences. Fifty-three agricultural education teachers report owning and operating a farm. Working in a finance related position was the least selected option with only five participants indicating being employed in that area. Nineteen (17.1%) of the participants stated that they have not been employed in any business related field. Teacher's business related occupational experience frequencies are located in Table 11.

Table 11 Business Related Occupational Experiences of Mississippi and Tennessee Agricultural Teachers ($N = 111$)

Experience	<i>f</i>	%
Owned a Farm	53	47.7
Sales Position	36	32.4
Owned a Business	36	32.4
Intern with a Company	34	30.6
Management Position	31	27.9
Marketing Position	15	13.5
Merchandizing Position	13	11.7
Finance Position	5	4.5
Other Business Related Experience	2	1.8

Professional Development

Eighty-six participants had attended an agribusiness or business related professional development event. Agribusiness professional development conducted by the Mississippi or Tennessee associations of agricultural educators was the most attended source with 67 teachers selecting that option. Eight participants reported attending an agribusiness or business related professional development hosted by a non-land grant college or university. Twenty-five secondary agricultural education teachers stated that they have not participated in agribusiness professional development. Table 12 includes frequencies and percentages for all sources for professional development survey options.

Table 12 Professional Development Sources Available to Mississippi and Tennessee Agricultural Teachers ($N = 111$)

Source	f	%
State Association of Agricultural Educators	67	60.4
State Department of Education	62	55.9
Land Grant University	31	27.9
NAAE	25	22.5
Other Professional Organization	19	17.1
Private Industry	17	15.3
State Department of Agriculture	15	13.5
USDE	9	8.1
USDA	9	8.1
Non Land Grant University	8	7.2
Other Professional Development Source	5	4.5
No Agribusiness Professional Development	25	22.5

Years of Experience

Secondary agricultural education participants had approximately 12 years of experience ($M = 11.78$, $SD = 10.70$). Three teachers reported no years of experience (teachers in their first year). One teacher had 43 years of experience. The median years of experience was 8 years.

Table 13 presents the grouped frequency distribution for *Years of Experience*.

Table 13 Years of Experience of Mississippi and Tennessee Agricultural Teachers ($N = 111$)

Years of Experience	f	%
0-5	43	38.8
6-10	21	18.9
11-15	11	9.9
16-20	19	17.1
21-25	5	4.5
26-30	2	1.8
>30	10	9.0

Age

The average age of Mississippi and Tennessee secondary agricultural education teacher participants was approximately 40 years ($M = 39.61$, $SD = 12.22$). The youngest secondary agricultural education teacher in the study was 21 years old. The eldest participant was 67 years old. The median age was 39 years. The grouped frequency distribution for *Age* is found in Table 14.

Table 14 Age of Mississippi and Tennessee Agricultural Teachers ($N = 111$)

Age	<i>f</i>	%
21-25	13	11.8
26-30	20	18.0
31-35	14	12.6
36-40	15	13.5
41-45	17	15.3
46-50	7	6.3
51-55	10	9.0
56-60	8	7.2
>60	7	6.3

Research Objective Two

Determine major agribusiness themes using Mississippi and Tennessee agricultural education state competencies.

A principal component analysis was conducted with the 88 Mississippi and Tennessee agribusiness course competencies using direct oblimin (oblique) rotation. Using Kaiser's criterion of 1, nine factors with an eigenvalue greater than 1 combined to explain 78.03% of the variance.

The correlation matrix was examined to determine the degree to which the competencies are correlated as described by Field (2013). Fifteen pairs of competencies had a correlation

below 0.3. One pair of competencies had a correlation above 0.9. The majority of the correlations being between 0.3 and 0.9 suggests reasonable factorability and limited multicollinearity issues (Field, 2013). The Kaiser-Meyer-Olkin measure of 0.89 indicated that the sample was adequate for analysis, “Meritorious” according to Hutcheson and Sofronious (1999). Bartlett’s Test of Sphericity ($\chi^2_{3828} = 13087.07, p < 0.001$) proved that the data set was appropriate for factor analysis.

Appendix D contains the factorial analysis structure matrix. Agribusiness competencies were grouped using the greatest correlation according to the structure matrix. Each factor was given a name based on the agribusiness competencies that loaded on the factor. Appendix C lists the course competencies associated with each factor.

Cronbach’s α indicated high internal consistency reliabilities for all the competencies as well as the competencies associated with each individual factor (all Cronbach’s $\alpha > 0.904$).

Table 15 includes the total number of competencies per each factor and the factor’s Cronbach’s α .

Table 15 Number of Competencies and Cronbach’s α for each Factor and All 88 Competencies ($N = 111$)

	Number of Competencies	Cronbach’s α
Management and Entrepreneurship	28	0.993
Budgeting	11	0.985
Legal Regulations	6	0.904
Finance	11	0.949
Agribusiness Marketing	5	0.913
Risk Management	6	0.948
Business Planning	6	0.924
Agribusiness Importance	5	0.920
Macroeconomics	10	0.964
Total	88	0.993

Research Objective Three

Determine agricultural education teacher agribusiness self-efficacy using Mississippi and Tennessee agricultural education state competencies.

Means, standard deviations, medians, modes, and ranges were determined for each competency and each participant. *Examine the importance of personal budgeting* competency had the highest mean ($M = 3.92, SD = 0.90$), and *Analyze the role of government in setting monetary, fiscal, and taxation policies that affect the operations of agriculture* competency had the lowest mean ($M = 2.67, SD = 1.07$). Appendix E includes mean, median, mode, and range for each competency.

A mean was calculated for each participant based on their self-efficacy rating for each competency. The calculated mean became a participant's *Overall Competency*. Participant's *Overall Competency* variable ranged from 1.17 ($SD = 0.43$) to 4.78 ($SD = 0.43$) on a scale of 1 to 5. The mean *Overall Competency* was 3.18 ($SD = 0.79$).

A mean was calculated for each of the individual factor themes which became a participant's dependent variable score for Objective 4 statistical analysis. *Budgeting* had the highest mean ($M = 3.59, SD = 0.80$). *Risk Management* had the lowest mean ($M = 2.84, SD = 0.80$). Means and standard deviations of the *Overall Competency* and the nine factors are located in Table 16

Table 16 Means and Standard Deviations for each Factor and All 88 Competencies

	<i>M</i>	<i>SD</i>
Overall Competency	3.18	0.79
Management and Entrepreneurship	3.15	0.87
Budgeting	3.59	0.80
Legal Regulations	2.99	0.80
Finance	3.27	0.79
Agribusiness Marketing	3.19	0.85
Risk Management	2.84	0.90
Business Planning	3.18	0.87
Agribusiness Importance	3.46	0.88
Macroeconomics	2.86	0.91

Note: Self-efficacy scores ranged from 1 to 5

Research Objective Four

Discover if a relationship exists between teacher agribusiness self-efficacy and various demographics.

Dependent Variable Assumptions Check

Overall Competency and the nine competency factor means were checked for outliers and normality. No outliers existed for *Overall Competency* or the nine competency factor means. At least 92% of the cases were found within one standard deviation of the mean *Overall Competency* and the nine factor means. The *Overall Competency* and eight factor means produced a non-significant Shapiro-Wilk test ($p > 0.05$). The Shapiro-Wilk test for *Budgeting* was significant (0.958, $df = 111$, $p < 0.001$). *Budgeting* was transformed by squaring the variable (\wedge^2). Transformed *Budgeting* had a non-significant Shapiro-Wilk test result (0.984, $df = 111$, $p = 0.196$). *Budgeting* was used as transformed when dependent variable normality assumption was needed.

Collegiate Course Type

All multiple linear regression assumptions were met. Homoscedasticity was checked by analyzing a plot of the standardized residuals. Independence was confirmed with all Durbin-Watson tests resulting in values between 1 and 3. Multicollinearity was determined not a concern with variance inflation factors (VIF) being approximately 1.0.

Three courses (Marketing, Introduction to Agribusiness, and Microeconomics) entered into regression equations for *Overall Competency* ($R^2 = 0.180$, $F_{3,107} = 7.82$, $p < 0.001$), *Management and Entrepreneurship* ($R^2 = 0.166$, $F_{3,107} = 7.08$, $p < 0.001$), *Agribusiness Marketing* ($R^2 = 0.178$, $F_{3,107} = 7.71$, $p < 0.001$), and *Business Planning* ($R^2 = 0.186$, $F_{3,107} = 8.14$, $p < 0.001$). Marketing and Introduction to Agribusiness were the only courses that were included in the regression equation for *Budgeting* ($R^2 = 0.131$, $F_{2,108} = 8.11$, $p = 0.001$) and *Agribusiness Importance* ($R^2 = 0.159$, $F_{2,108} = 10.20$, $p < 0.001$). The *Legal Regulations* regression ($R^2 = 0.165$, $F_{2,108} = 10.64$, $p < 0.001$) and *Finance* regression ($R^2 = 0.139$, $F_{2,108} = 8.72$, $p < 0.001$) included Farm Management and Marketing courses. Marketing and Finance entered into the regression equation for *Risk Management* ($R^2 = 0.132$, $F_{2,108} = 8.25$, $p < 0.001$). Business Law was the only course that entered into *Macroeconomics* multiple linear regression equation ($R^2 = 0.061$, $F_{1,109} = 7.13$, $p = 0.009$).

The regression model form *Overall Competency* explained 18.0% of the variance associated with the mean competency self-efficacy rating of Mississippi and Tennessee secondary agricultural education teachers. The models for the nine individual factor means explained between 6.1% (*Macroeconomics*) and 18.6% (*Business Planning*) of the variance associated with the factor means. Table 17 includes the means and standard deviations for *Collegiate Course Type* for each of dependent variables. Table 18 lists the R^2 values and

equations for each of the multiple linear regression models. All β_i coefficients are listed in Table 19 for *Collegiate Course Type*.

Table 17 Means and Standard Deviations of Collegiate Course Type completed by Mississippi and Tennessee Secondary Agricultural Teachers ($N = 111$)

Course	Overall	ME	B	LR	F	AM	RM	BP	AI	M
Introduction to Agribusiness	3.26 (0.77)	3.23 (0.84)	3.66 (0.79)	3.07 (0.78)	3.34 (0.78)	3.10 (0.83)	2.92 (0.85)	3.27 (0.84)	3.55 (0.86)	2.95 (0.90)
Microeconomics	3.47 (0.79)	3.48 (0.90)	3.81 (0.67)	3.27 (0.75)	3.51 (0.76)	3.55 (0.86)	3.16 (0.90)	3.56 (0.95)	3.70 (0.83)	3.13 (0.96)
Macroeconomics	3.37 (0.80)	3.34 (0.93)	3.77 (0.65)	3.22 (0.85)	3.44 (0.74)	3.34 (0.93)	3.09 (0.91)	3.42 (0.96)	3.66 (0.82)	3.00 (0.92)
Marketing	3.61 (0.68)	3.58 (0.70)	3.98 (0.71)	3.45 (0.71)	3.71 (0.75)	3.65 (0.76)	3.32 (0.85)	3.62 (0.82)	3.99 (0.72)	3.21 (0.82)
Business Law	3.58 (0.71)	3.58 (0.78)	3.84 (0.82)	3.41 (0.66)	3.70 (0.67)	3.63 (0.70)	3.31 (0.80)	3.57 (0.83)	3.54 (0.71)	3.30 (0.82)
Management	3.40 (0.69)	3.38 (0.77)	3.78 (0.60)	3.21 (0.55)	3.47 (0.77)	3.34 (0.76)	3.13 (0.73)	3.40 (0.80)	3.69 (0.73)	3.09 (0.85)
Farm Management	3.35 (0.71)	3.29 (0.80)	3.78 (0.65)	3.25 (0.76)	3.48 (0.71)	3.33 (0.79)	3.06 (0.86)	3.33 (0.82)	3.67 (0.78)	2.98 (0.89)
Entrepreneurship	3.30 (0.95)	3.35 (0.97)	3.47 (0.97)	3.08 (0.89)	3.42 (1.04)	3.38 (0.76)	3.08 (1.07)	3.28 (0.99)	3.44 (1.15)	3.02 (0.97)
Accounting	3.52 (0.63)	3.54 (0.64)	3.85 (0.68)	3.22 (0.58)	3.59 (0.73)	3.43 (0.73)	3.23 (0.78)	3.50 (0.72)	3.95 (0.61)	3.22 (0.82)
Finance	3.75 (0.62)	3.71 (0.71)	4.13 (0.54)	3.58 (0.53)	3.84 (0.75)	3.58 (0.66)	3.59 (0.63)	3.76 (0.77)	4.15 (0.62)	3.43 (0.64)
Personal Finance	3.43 (0.88)	3.41 (0.97)	3.87 (0.84)	3.19 (0.92)	3.59 (0.90)	3.35 (0.90)	3.18 (0.97)	3.37 (1.00)	3.63 (0.90)	3.14 (1.05)
Other Course	3.47 (0.65)	3.40 (0.72)	3.89 (0.69)	3.28 (0.59)	3.69 (0.70)	3.42 (0.54)	3.15 (0.81)	3.32 (0.76)	3.78 (0.74)	3.18 (0.70)

(Standard Deviations are in parentheses)

ME – Management and Entrepreneurship; B – Budgeting; LR – Legal Regulations;

F – Finance; AM – Agribusiness Marketing, RM – Risk Management;

BP – Business Planning; AI – Agribusiness Importance; M – Macroeconomics

Note: Self-efficacy scores ranged from 1 to 5

Table 18 Multiple Regression Summary on Self Efficacy of 10 Agribusiness Self-Efficacy variables by Collegiate Course Type ($N = 111$)

Dependent Variable	R^2 Value	Equation
Overall Competency	0.180	0.456(Introduction to Agribusiness) + 0.422(Marketing) + 0.354(Microeconomics) + 3.031
Management and Entrepreneurship	0.166	0.483(Introduction to Agribusiness) + 0.413(Microeconomics) + 0.406(Marketing) + 2.507
Budgeting ^T	0.131	3.482(Marketing) + 2.684(Introduction to Agribusiness) + 10.388
Legal Regulations	0.165	0.502(Marketing) + 0.385(Farm Management) + 2.684
Finance	0.139	0.505(Marketing) + 0.301(Farm Management) + 2.998
Agribusiness Marketing	0.178	0.442(Microeconomics) + 0.436(Marketing) + 0.416(Introduction to Agribusiness) + 2.591
Risk Management	0.132	0.613(Finance) + 0.507(Marketing) + 2.66
Business Planning	0.186	0.513(Introduction to Agribusiness) + 0.477(Microeconomics) + 0.391(Marketing) + 2.502
Agribusiness Importance	0.159	0.652(Marketing) + 0.450(Introduction to Agribusiness) + 2.912
Macroeconomics	0.061	0.555(Business Law) + 2.741

T – Transformed

Table 19 Collegiate Business Related Courses β_i Coefficients for Agribusiness Self-Efficacy on the 10 Agribusiness Self-Efficacy variables ($N = 111$)

Course	Overall	ME	B ^T	LR	F	AM	RM	BP	AI	M
Introduction to Agribusiness	0.456*	0.483*	2.684*	0.110		0.416*	0.151	0.512*	0.450*	0.180
					0.127					
Microeconomics	0.354*	0.413*	0.134	0.162	0.135	0.442**	0.130	0.477**	0.129	0.162
Macroeconomics	0.062	0.043	0.123	0.136	0.090	-0.040	0.100	0.068	0.141	0.099
Marketing	0.422*	0.406*	3.482**	0.502**	0.505*	0.436*	0.507*	0.391*	0.652***	0.131
Business Law	0.071	0.081	-0.014	0.123	0.148	0.082	0.166	0.032	0.020	0.555*
Management	0.005	0.006	0.004	0.064	0.053	-0.064	0.090	-0.014	0.024	0.084
Farm Management	0.091	0.045	0.101	0.385**	0.301**	0.038	0.164	0.038	0.120	0.101
Entrepreneurship	0.002	0.037	-0.109	-0.056	-0.027	0.025	0.001	-0.003	-0.088	0.001
Accounting	0.100	0.121	0.062	0.024	0.106	-0.004	0.059	0.061	0.186	0.134
Finance	0.104	0.077	0.157	0.150	0.153	-0.013	0.613*	0.069	0.169	0.152
Personal Finance	0.028	0.022	0.078	0.001	0.064	-0.029	0.028	-0.014	-0.008	0.076
Other Business Related Course	0.140	0.123	0.108	0.113	0.161	0.114	0.086	0.083	0.101	0.103

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

^T – Transformed

ME – Management and Entrepreneurship; B – Budgeting; LR – Legal Regulations;

F – Finance; AM – Agribusiness Marketing, RM – Risk Management;

BP – Business Planning; AI – Agribusiness Importance; M – Macroeconomics

Number of Collegiate Business Related Courses

Assumption analysis produced several issues for the *Number of Collegiate Courses* variable. Two outliers (Case 14 with a value of 36 and Case 93 with a value of 32) existed in the data. The Shapiro-Wilk test for *Number of Collegiate Courses* was significant (0.629, $df = 102$, $p < 0.001$), indicating non-normality. Analysis of residual graphs indicated heteroscedasticity. Field (2013) suggested using Spearman correlation coefficient (r_s) when one of two variables have issues with normality and outliers. The 102 cases were analyzed using Spearman's r_s .

Number of Collegiate Courses completed was significantly related to all 10 of the *Agribusiness Self-Efficacy* variables ($p < 0.001$). The greatest relationship was between *Number of Collegiate Courses* and *Legal Regulations* ($r_s = 0.445$, $p < 0.001$). *Number of Collegiate Courses* and *Budgeting* ($r_s = 0.54$, $p < 0.001$) were the least related. All correlations have a medium-large effect size (Watson, 2018). Results for Spearman's correlation tests are found in Table 20.

Table 20 Spearman's Coefficient for Number of Collegiate Courses Completed and the 10 Agribusiness Self-Efficacy variables ($n = 102$)

Variable	r_s
Overall Competency	0.422***
Management and Entrepreneurship	0.405***
Budgeting	0.354***
Legal Regulations	0.445***
Finance	0.408***
Agribusiness Marketing	0.375***
Risk Management	0.412***
Business Planning	0.403***
Agribusiness Importance	0.393***
Macroeconomics	0.373***

*** $p < 0.001$

Education Level

SPSS removes groups with single cases from analysis for Levene's test. SPSS also does not conduct post hoc ANOVA testing when a group has only one case. Results from one sample t test indicate that the *Overall Competency* and nine individual factor means for the secondary agricultural education teacher with a doctoral degree were statistically significant ($p < 0.05$) as compared to the educational specialist's degree group. However, comparing a combined educational specialist's and doctoral group with the master's degree group results in no significant difference ($p > 0.05$) using an independent samples t test. It was determined to analyze the data with two groups (bachelor's degree ($n = 58$) and graduate degree ($n = 53$)) to maximize the sample size using an independent samples *t*-test.

Levene's test revealed that homogeneity assumption was met ($p > 0.05$). The independent samples t test for the transformed *Budgeting* ($t = 3.03$, $df = 109$, $p = 0.003$) scores are greater for the bachelor's degree group ($M = 3.28$, $SD = 0.691$) as compared to the graduate degree group ($M = 3.06$, $SD = 0.874$). This result had a medium effect size (Cohen's $d = 0.57$). All remaining dependent variables have non-significant results ($p > 0.05$). Table 21 contains *Overall Competency* and the nine themes means and standard deviations for bachelor's degree and graduate degree groups as well as independent sample *t*-test results.

Table 21 Highest Educational Level of Education Completed by Mississippi and Tennessee Secondary Agricultural Teachers Means, Standard Deviations and Independent Sample t Test Results ($N = 111$; $df = 109$)

Variable	Bachelor's Degree		Graduate Degree		<i>t</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Overall Competency	3.28	0.69	3.06	0.87	1.43
Management and Entrepreneurship	3.23	0.79	3.05	0.94	1.11
Budgeting	3.81	0.65	3.35	0.88	3.03**
Legal Regulations	3.05	0.72	2.93	0.87	0.80
Finance	3.36	0.70	3.18	0.88	1.21
Agribusiness Marketing	3.30	0.81	3.08	0.09	1.35
Risk Management	2.97	0.80	2.71	0.98	1.50
Business Planning	3.26	0.79	3.10	0.95	1.01
Agribusiness Importance	3.59	0.79	3.31	0.95	1.67
Macroeconomics	2.90	0.83	2.81	0.99	0.55

*** $p < 0.01$

Note: Self-efficacy scores ranged from 1 to 5

College Major

Business / Economics and Education undergraduate categories, single case groups, were analyzed to determine if they were similar to Other Non-Agricultural undergraduate major.

Results from one sample *t*-test indicated that the *Overall Competency* and the nine factor means for the secondary agricultural education teacher who majored in Business / Economics as well as the secondary agricultural education teacher who majored in Education were not statistically different ($p > 0.05$) than the Other Non-Agricultural undergraduate major group. Therefore, Business / Economics and Education undergraduate majors were reclassified to be included in the Other Non-Agricultural group for SPSS ANOVA undergraduate *College Major* analysis.

Assumption analysis produced non-significant results for homogeneity (Levene's test > 0.05). ANOVA tests revealed no statistically significant differences between undergraduate *College Major* for the 10 dependent variables. Large effect sizes were found for all dependent

variables. Undergraduate *College Major* means and standard deviations are presented in Table 22, and ANOVA tables are found in Table 23.

Table 22 Mississippi and Tennessee Secondary Agricultural Teacher Undergraduate College Major Means and Standard Deviations for the 10 Agribusiness Self-Efficacy variables ($N = 111$)

Course	<i>N</i>	Overall	ME	B	LR	F	AM	RM	BP	AI	M
Agricultural Education	48	3.11 (0.73)	3.08 (0.80)	3.57 (0.73)	2.89 (0.78)	3.21 (0.72)	3.14 (0.87)	2.70 (0.85)	3.15 (0.85)	3.42 (0.86)	2.77 (0.85)
Agribusiness	17	3.67 (0.60)	3.65 (0.67)	3.98 (0.54)	3.46 (0.41)	3.75 (0.74)	3.66 (0.64)	3.42 (0.67)	3.66 (0.74)	3.94 (0.63)	3.43 (0.69)
Animal Science	25	3.16 (0.80)	3.18 (0.95)	3.38 (0.99)	3.05 (0.95)	3.25 (0.88)	3.17 (0.81)	2.91 (1.01)	3.13 (0.89)	3.41 (0.94)	2.85 (1.06)
Plant Science	5	3.24 (0.57)	3.34 (0.58)	3.51 (0.44)	2.93 (0.78)	3.20 (0.76)	3.20 (0.69)	2.80 (0.90)	3.33 (0.57)	3.40 (0.42)	3.00 (0.60)
Natural Resources	7	2.74 (1.14)	2.65 (1.30)	3.42 (0.93)	2.60 (1.07)	2.78 (1.01)	2.69 (1.30)	2.45 (1.13)	2.55 (0.97)	3.03 (1.32)	2.49 (1.27)
Other Ag Major	5	2.94 (0.67)	2.73 (0.75)	3.56 (0.75)	2.77 (0.53)	3.22 (0.71)	3.00 (0.68)	2.67 (0.87)	3.10 (0.89)	3.16 (0.74)	2.60 (0.64)
Other Non-Ag Major	4	2.95 (0.69)	2.75 (0.80)	3.87 (1.17)	2.96 (0.60)	2.07 (0.49)	3.15 (0.84)	2.58 (0.62)	3.04 (1.11)	3.40 (0.99)	2.25 (0.65)

(Standard Deviations are in parentheses)

ME – Management and Entrepreneurship; B – Budgeting; LR – Legal Regulations;

F – Finance; AM – Agribusiness Marketing, RM – Risk Management;

BP – Business Planning; AI – Agribusiness Importance; M – Macroeconomics

Note: Self-efficacy scores ranged from 1 to 5

Table 23 Mississippi and Tennessee Secondary Agricultural Teacher Undergraduate College Major ANOVA Results for the 10 Agribusiness Self-Efficacy variables ($N = 111$)

Dependent Variable		<i>Df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>P</i>	η^2
Overall Competency Mean	Between	6	6.14	1.02	1.71	0.13	0.30
	Within	104	62.18	0.60			
	Total	110	68.32				
Management and Entrepreneurship	Between	6	7.86	1.33	1.85	0.10	0.31
	Within	104	74.36	0.72			
	Total	110	82.31				
Budgeting ^T	Between	6	193.28	32.21	1.14	0.35	0.25
	Within	104	2948.16	28.34			
	Total	110	3141.44				
Legal Regulations	Between	6	5.72	0.95	1.54	0.17	0.29
	Within	104	64.35	0.62			
	Total	110	70.07				
Finance	Between	6	5.97	1.00	1.64	0.14	0.29
	Within	104	62.96	0.61			
	Total	110	68.93				
Agribusiness Marketing	Between	6	5.85	0.98	1.38	0.23	0.24
	Within	104	73.67	0.71			
	Total	110	79.52				
Risk Management	Between	6	8.23	1.37	1.78	0.11	0.31
	Within	104	80.31	0.77			
	Total	110	88.54				
Business Planning	Between	6	7.02	1.17	1.61	0.15	0.29
	Within	104	75.69	0.73			
	Total	110	82.71				
Agribusiness Importance	Between	6	5.88	0.98	1.30	0.27	0.26
	Within	104	78.63	0.76			
	Total	110	84.51				
Macroeconomics	Between	6	8.92	1.49	1.87	0.09	0.31
	Within	104	82.44	0.79			
	Total	110	91.36				

^T – Transformed

The graduate major of Plant Science with emphasis in Agronomy single case was determined to be statistically similar ($p > 0.05$) to Plant Science with emphasis in Horticulture graduate major group using a one sample t test. The Agronomy single case was combined with the Horticulture group were combined to become Plant Science graduate major to allow for SPSS analysis.

Testing for assumption of homogeneity revealed significant Levene's test results for *Macroeconomics* ($F_{6,61} = 3.34, p = 0.007$). *Macroeconomics* ANOVA results included Brown-Forsythe F ratio and Games-Howell post hoc testing as needed. All other assumptions for ANOVA analysis were met.

ANOVA tests revealed no statistically significant differences between graduate *College Major* across the 10 dependent variables. The Brown-Forsythe F ratio for *Macroeconomics* ($F_{6,2.328} = 0.43, p = 0.82$) was also not significantly different across all groups. Large effect sizes were found in all graduate *College Major* analyses. Table 24 includes means and standard deviations for graduate *College Major*. ANOVA results for graduate *College Major* are found in Table 25.

Table 24 Mississippi and Tennessee Secondary Agricultural Teacher Graduate College Major Means and Standard Deviations ($n = 68$)

Course	<i>N</i>	Overall	ME	B	LR	F	AM	RM	BP	AI	M
Agricultural Education	29	3.07 (0.89)	3.06 (0.93)	3.28 (0.64)	2.90 (0.85)	3.14 (0.84)	3.20 (0.94)	2.75 (0.99)	3.12 (1.06)	3.30 (0.98)	2.85 (0.98)
Animal Science	8	3.13 (0.82)	3.16 (0.83)	3.38 (0.89)	3.25 (0.82)	3.20 (0.86)	2.98 (0.78)	2.92 (0.79)	3.02 (0.92)	3.38 (1.03)	2.76 (1.16)
Plant Science	3	2.73 (0.53)	2.70 (0.73)	3.42 (0.52)	2.61 (0.51)	2.51 (0.55)	2.47 (0.42)	2.33 (0.44)	3.05 (0.25)	3.27 (0.46)	2.23 (0.67)
Natural Resources	5	3.07 (1.06)	3.06 (1.24)	3.66 (0.90)	2.80 (1.02)	3.07 (1.10)	2.84 (0.92)	2.77 (1.18)	3.23 (1.15)	3.24 (1.11)	2.76 (0.92)
Other Ag Major	2	3.40 (1.77)	3.33 (2.17)	3.64 (1.03)	2.92 (1.29)	3.69 (1.35)	3.80 (1.41)	2.67 (2.12)	3.92 (1.29)	3.70 (1.28)	3.10 (2.69)
Education – Instruction	8	3.57 (0.44)	3.64 (0.38)	3.82 (0.55)	3.52 (0.42)	3.67 (0.69)	3.48 (0.43)	3.19 (0.57)	3.46 (0.47)	3.73 (0.60)	3.30 (0.55)
Education - Administration	13	2.73 (0.78)	2.67 (0.83)	3.11 (0.78)	2.63 (0.89)	2.86 (0.79)	2.82 (0.93)	2.41 (0.91)	2.70 (0.78)	2.97 (0.89)	2.47 (0.80)

(Standard Deviations are in parentheses)

ME – Management and Entrepreneurship; B – Budgeting; LR – Legal Regulations;

F – Finance; AM – Agribusiness Marketing, RM – Risk Management;

BP – Business Planning; AI – Agribusiness Importance; M – Macroeconomics

Note: Self-efficacy scores ranged from 1 to 5

Table 25 Mississippi and Tennessee Secondary Agricultural Teacher Graduate College Major ANOVA Results for the 10 Agribusiness Self-Efficacy variables ($n = 68$)

Dependent Variable		<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>	η^2
Overall Competency Mean	Between	6	4.09	0.68	0.95	0.46	0.29
	Within	61	43.57	0.71			
	Total	67	47.66				
Management and Entrepreneurship	Between	6	5.29	0.88	1.07	0.39	0.31
	Within	61	50.34	0.83			
	Total	67	55.63				
Budgeting ^T	Between	6	136.51	22.75	0.78	0.59	0.27
	Within	61	1787.48	29.30			
	Total	67	1923.99				
Legal Regulations	Between	6	5.21	0.87	1.27	0.29	0.33
	Within	61	41.77	0.69			
	Total	67	46.98				
Finance	Between	6	5.10	0.85	1.21	0.31	0.33
	Within	61	42.91	0.70			
	Total	67	48.01				
Agribusiness Marketing	Between	6	5.11	0.85	1.11	0.36	0.31
	Within	61	46.61	0.76			
	Total	67	51.72				
Risk Management	Between	6	3.77	0.63	0.70	0.65	0.25
	Within	61	54.52	0.89			
	Total	67	58.29				
Business Planning	Between	6	4.54	0.76	0.87	0.52	0.28
	Within	61	53.14	0.87			
	Total	67	57.68				
Agribusiness Importance	Between	6	3.25	0.54	0.62	0.72	0.24
	Within	61	53.59	0.88			
	Total	67	56.84				
Macroeconomics ^a	Between	6	4.66	0.78	0.82	0.56	0.27
	Within	61	57.60	0.94			
	Total	67	62.26				

^T – Transformed

^a – Brown-Forsythe $F_{6,2,328} = 0.43, p = 0.82$

Grade Point Average

Case 76 was the only participant that selected below 2.50 GPA. One sample *t*-tests indicated no significant difference ($p > 0.05$) for seven of the ten variables (*Overall Competency, Management and Entrepreneurship, Budgeting, Legal Regulations, Finance, Agribusiness*

Marketing, and *Business Planning*) in comparing Case 76 data to the 2.50 – 2.99 GPA group.

Significant one sample t test results existed for *Risk Management* ($p = 0.001$), *Agribusiness Importance* ($p = 0.004$), and *Macroeconomics* ($p = 0.026$). The below 2.50 GPA was reclassified to be included in the 2.50 – 2.99 GPA group for SPSS ANOVA analysis. The combined group is called “below 3.00 GPA”. Table 26 includes means and standard deviations for the three GPA groups.

Table 26 Mississippi and Tennessee Secondary Agricultural Teacher Undergraduate GPA Means and Standard Deviations for the 10 Agribusiness Self-Efficacy variables ($N = 111$)

Dependent Variable	3.50 – 4.00 ($n = 39$)		3.00 – 3.49 ($n = 50$)		Below 3.00 ($n = 22$)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Overall Competency	2.92	0.88	3.36	0.70	3.23	0.71
Management and Entrepreneurship	2.86	0.93	3.34	0.80	3.20	0.78
Budgeting	3.44	1.00	3.72	0.67	3.54	0.64
Legal Regulations	2.70	0.83	3.10	0.76	3.29	0.67
Finance	3.00	0.90	3.45	0.71	3.34	0.65
Agribusiness Marketing	2.92	0.98	3.40	0.73	3.22	0.76
Risk Management	2.54	0.92	3.04	0.87	2.93	0.81
Business Planning	2.99	0.93	3.39	0.82	3.06	0.77
Agribusiness Importance	3.22	1.04	3.60	0.73	3.56	0.81
Macroeconomics	2.55	0.95	3.05	0.85	2.95	0.88

Note: Self-efficacy scores ranged from 1 to 5

Levene’s test results suggested a violation of the assumption of homogeneity with significant results for transformed *Budgeting* ($F_{2,108} = 3.36, p = 0.04$) and *Agribusiness Importance* ($F_{2,108} = 3.60, p = 0.03$). ANOVA results included Brown-Forsythe F ratio and Games-Howell post hoc testing for *Budgeting* and *Agribusiness Importance*. All other Levene’s tests were non-significant ($p > 0.05$), and all other assumptions were met for ANOVA.

ANOVA analysis revealed statistically significant results for seven of the 10 dependent variables (*Overall Competency, Management and Entrepreneurship, Legal Regulations, Finance, Agribusiness Marketing, Risk Management, and Macroeconomics*). *Budgeting, Business Planning, Agribusiness Importance* ANOVA testing produce non-significant results. The Brown-Forsythe F ratios for *Budgeting* ($F_{2,90.678} = 1.04, p = 0.36$) and *Agribusiness Importance* ($F_{2,82.620} = 2.23 p = 0.11$) were also not statistically significant. Effect sizes were large for all ANOVA tests. Table 27 includes results for *GPA* ANOVA tests.

Table 27 Mississippi and Tennessee Secondary Agricultural Teacher Undergraduate GPA ANOVA Results for the 10 Agribusiness Self-Efficacy variables ($N = 111$)

Dependent Variable		<i>Df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>	η^2
Overall Competency Mean	Between	2	4.33	2.17	3.66	0.03	0.25
	Within	108	63.99	0.59			
	Total	110	68.32				
Management and Entrepreneurship	Between	2	5.25	2.53	3.67	0.02	0.25
	Within	108	77.06	0.71			
	Total	110	82.31				
Budgeting ^{Ta}	Between	2	56.54	28.27	0.88	0.38	0.13
	Within	108	3084.90	28.56			
	Total	110	3141.44				
Legal Regulations	Between	2	5.86	2.93	4.93	0.01	0.29
	Within	108	64.21	0.60			
	Total	110	70.07				
Finance	Between	2	4.69	2.34	3.94	0.02	0.26
	Within	108	64.24	0.60			
	Total	110	68.93				
Agribusiness Marketing	Between	2	5.03	2.51	3.64	0.03	0.25
	Within	108	74.49	0.69			
	Total	110	79.52				
Risk Management	Between	2	5.63	2.81	3.67	0.03	0.25
	Within	108	82.91	0.77			
	Total	110	88.54				
Business Planning	Between	2	4.03	2.02	2.77	0.07	0.22
	Within	108	78.67	0.73			
	Total	110	82.70				
Agribusiness Importance ^b	Between	2	3.40	1.70	2.26	0.11	0.20
	Within	108	81.11	0.75			
	Total	110	84.51				
Macroeconomics	Between	2	5.66	2.83	3.57	0.03	0.25
	Within	108	85.70	0.79			
	Total	110	91.36				

^T – Transformed

^a – Brown-Forsythe $F_{2,90.678} = 1.04$, $p = 0.36$

^b – Brown-Forsythe $F_{2,82.620} = 2.23$ $p = 0.11$

Post hoc testing using Bonferroni revealed that 3.50 – 4.00 GPA group had a significantly lower ($p < 0.05$) Agribusiness Self-Efficacy mean when compared to 3.00 – 3.49 GPA group for Overall Competency, Management and Entrepreneurship, Finance, Agribusiness Marketing, Risk Management, and Macroeconomics. The 3.50 – 4.00 GPA group was significantly lower in

Legal Regulations when compared to below 3.00 group. The remaining factors were non-significant. Bonferroni post hoc test results are located in Table 28.

Table 28 Bonferroni Post Hoc Results for Significant Undergraduate GPA ANOVA Tests by Competency ($N = 111$)

Dependent Variable	A – B	B – C	A – C
Overall Competency	-0.44*	0.12	-0.32
Management and Entrepreneurship	-0.49*	0.15	-0.34
Legal Regulations	-0.40	-0.19	-0.59*
Finance	-0.46*	0.11	-0.35
Agribusiness Marketing	-0.48*	0.18	-0.30
Risk Management	-0.50*	0.11	-0.39
Macroeconomics	-0.50*	0.11	-0.39

* $p < 0.05$

A – 3.50 – 4.00 GPA Group

B – 3.00 – 3.49 GPA Group

C – Below 3.00 GPA Group

Certification Type

After producing a non-significant Levene's test ($p > 0.05$), no significant differences existed between traditionally and alternatively certified secondary agricultural teachers in the study ($p > 0.05$) for any of the agribusiness themes or *Overall Competency* using independent samples t test. Table 29 includes the means and standard deviations for traditionally and alternatively certified participants as well as independent samples *t*-test results.

Table 29 Mississippi and Tennessee Secondary Agricultural Teacher Certification Type Means, Standard Deviations, and Independent Samples t Test Results the 10 Agribusiness Self-Efficacy variables ($N = 111$, $df = 109$)

Variable	Traditional		Alternative		<i>t</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Overall Competency	3.26	0.76	3.06	0.81	1.37
Management and Entrepreneurship	3.21	0.84	3.06	0.90	0.92
Budgeting	3.71	0.76	3.43	0.83	1.84 ^T
Legal Regulations	3.03	0.82	2.94	0.77	0.58
Finance	3.39	0.75	3.11	0.82	1.84
Agribusiness Marketing	3.30	0.86	3.05	0.82	1.51
Risk Management	2.93	0.90	2.73	0.89	1.14
Business Planning	3.30	0.87	3.03	0.85	1.64
Agribusiness Importance	3.53	0.83	3.35	0.93	1.08
Macroeconomics	2.96	0.88	2.72	0.94	1.39

^T – Transformed

Note: Self-efficacy scores ranged from 1 to 5

Classes Taught

All assumptions were met for multiple linear regression analysis. Agribusiness was the only subject that entered into nine of the ten regression models (*Overall Competency* ($R^2 = 0.100$, $F_{1,109} = 12.10$, $p = 0.001$), *Management and Entrepreneurship* ($R^2 = 0.098$, $F_{1,109} = 11.88$, $p = 0.001$), *Budgeting* ($R^2 = 0.061$, $F_{1,109} = 7.03$, $p = 0.009$), *Legal Regulations* ($R^2 = 0.082$, $F_{1,109} = 9.74$, $p = 0.002$), *Finance* ($R^2 = 0.103$, $F_{1,109} = 12.51$, $p = 0.001$) *Agribusiness Marketing* ($R^2 = 0.087$, $F_{1,109} = 10.34$, $p = 0.002$), *Business Planning* ($R^2 = 0.113$, $F_{1,109} = 13.94$, $p < 0.001$), *Agribusiness Importance* ($R^2 = 0.146$, $F_{1,109} = 18.49$, $p < 0.001$), and *Macroeconomics* ($R^2 = 0.053$, $F_{1,109} = 6.05$, $p = 0.02$). The regression results for *Risk Management* ($R^2 = 0.125$, $F_{2,108} = 7.69$, $p = 0.001$) included Agribusiness and Other Agricultural Education Subject with Other Agricultural Education Subject having a negative β_i coefficient.

The regression model for *Overall Competency* explained 10.0% of the variance associated with the mean self-efficacy rating of Mississippi and Tennessee secondary

agricultural education teachers. The results for the nine factor means explained between 5.3% (*Macroeconomics*) and 14.6% (*Business Planning*) of the variance associated with the factor means. Table 30 contains means and standard deviations. Table 31 includes the R^2 values and equations for each of the multiple linear regression models. All *Subject Matter* β_i coefficients are listed in Table 32.

Table 30 Classes Taught by Mississippi and Tennessee Secondary Agricultural Teacher Means and Standard Deviations for the 10 Agribusiness Self-Efficacy variables ($N = 111$)

Classes Taught	Overall	ME	B	LR	F	AM	RM	BP	AI	M
General Agriculture	3.28 (0.73)	3.22 (0.83)	3.66 (0.72)	3.09 (0.80)	3.43 (0.68)	3.29 (0.76)	2.99 (0.82)	3.08 (0.78)	3.58 (0.79)	2.98 (0.91)
Agriscience	3.17 (0.81)	3.15 (0.88)	3.56 (0.81)	2.98 (0.82)	3.28 (0.81)	3.19 (0.86)	2.83 (0.92)	3.02 (0.89)	3.44 (0.89)	2.85 (0.94)
Agribusiness	3.56 (0.68)	3.56 (0.70)	3.87 (0.78)	3.34 (0.66)	3.66 (0.70)	3.58 (0.73)	3.20 (0.82)	3.63 (0.75)	3.97 (0.83)	3.18 (0.85)
Animal Science	3.24 (0.80)	3.22 (0.88)	3.61 (0.79)	3.02 (0.81)	3.36 (0.79)	3.28 (0.84)	2.90 (0.92)	3.27 (0.90)	3.53 (0.89)	2.91 (0.92)
Veterinary Science	3.20 (0.89)	3.22 (0.96)	3.46 (0.87)	3.00 (0.81)	3.27 (0.89)	3.23 (0.96)	2.94 (0.93)	3.27 (1.00)	3.44 (1.03)	2.91 (1.00)
Agronomy	3.32 (0.81)	3.30 (0.82)	3.72 (0.68)	3.10 (0.80)	3.42 (0.71)	3.37 (0.76)	3.02 (0.85)	3.33 (0.81)	3.61 (0.79)	2.99 (0.90)
Horticulture	3.19 (0.76)	3.15 (0.83)	3.60 (0.78)	2.96 (0.78)	3.32 (0.78)	3.18 (0.86)	2.87 (0.85)	3.24 (0.82)	3.48 (0.85)	2.83 (0.87)
Agricultural Engineering	3.29 (0.74)	3.26 (0.82)	3.73 (0.68)	3.09 (0.83)	3.40 (0.74)	3.26 (0.90)	3.00 (0.82)	3.22 (0.94)	3.59 (0.85)	2.97 (0.88)
Natural Resource Management	3.27 (0.70)	3.24 (0.77)	3.67 (0.73)	3.02 (0.79)	3.40 (0.72)	3.28 (0.79)	2.98 (0.80)	3.23 (0.74)	3.58 (0.84)	2.95 (0.78)
Food Science	3.18 (0.91)	3.22 (0.96)	3.56 (0.91)	2.75 (1.01)	3.15 (0.87)	3.33 (0.96)	2.92 (1.11)	3.20 (1.13)	3.43 (0.95)	2.83 (0.84)
Leadership / Communications	3.37 (0.63)	3.36 (0.68)	3.72 (0.69)	3.16 (0.62)	3.51 (0.66)	3.42 (0.66)	3.01 (0.78)	3.37 (0.72)	3.66 (0.79)	3.03 (0.73)
Other Agricultural Education Subject	2.78 (0.86)	2.70 (0.90)	3.44 (1.05)	2.58 (0.77)	2.88 (0.88)	2.87 (0.97)	2.18 (0.88)	2.71 (0.79)	3.22 (1.05)	2.41 (0.90)

(Standard Deviations are in parentheses)

ME – Management and Entrepreneurship; B – Budgeting; LR – Legal Regulations;

F – Finance; AM – Agribusiness Marketing, RM – Risk Management;

BP – Business Planning; AI – Agribusiness Importance; M – Macroeconomics

Note: Self-efficacy scores ranged from 1 to 5

Table 31 Multiple Regression Summary on Self Efficacy of 10 Agribusiness Self-Efficacy variables by Courses Taught by Mississippi and Tennessee Secondary Agricultural Teachers ($N = 111$)

Dependent Variable	R^2 Value	Equation
Overall Competency	0.100	$0.543(\text{Agribusiness}) + 3.106$
Management and Entrepreneurship	0.098	$0.591(\text{Agribusiness}) + 2.972$
Budgeting ^T	0.061	$2.865(\text{Agribusiness}) + 12.663$
Legal Regulations	0.082	$0.498(\text{Agribusiness}) + 2.846$
Finance	0.103	$0.553(\text{Agribusiness}) + 3.105$
Agribusiness Marketing	0.087	$0.545(\text{Agribusiness}) + 3.031$
Risk Management	0.125	$0.495(\text{Agribusiness}) - 0.721(\text{Other Agricultural Subject}) + 3.031$
Business Planning	0.113	$0.636(\text{Agribusiness}) + 2.996$
Agribusiness Importance	0.146	$0.729(\text{Agribusiness}) + 3.241$
Macroeconomics	0.053	$0.455(\text{Agribusiness}) + 2.721$

T – Transformed

Table 32 β_i Coefficients for Courses Taught by Mississippi and Tennessee Secondary Agricultural Teachers on the 10 Agribusiness Self-Efficacy variables (N=111)

Subject Area	Overall	ME	B	LR	F	AM	RM	BP	AI	M
General Agriculture	0.089	0.049	0.043	0.079	0.151	0.070	0.114	0.094	0.092	0.096
Agriscience	-0.070	-0.043	-0.150	-0.115	-0.016	-0.043	-0.097	-0.014	-0.105	-0.058
Agribusiness	0.543**	0.591**	2.865**	0.498**	0.553**	0.545**	0.495**	0.636**	0.729**	0.455*
Animal Science	0.070	0.075	-0.010	-0.012	0.133	0.113	0.023	0.085	0.072	0.045
Veterinary Science	0.011	0.041	-0.102	-0.005	-0.010	0.024	0.022	0.049	-0.027	0.031
Agronomy	0.114	0.104	0.098	0.080	0.117	0.133	0.082	0.101	0.099	0.090
Horticulture	0.047	0.041	0.035	-0.019	0.097	0.018	0.036	0.099	0.061	0.000
Agricultural Engineering	0.082	0.068	0.106	0.063	0.101	0.034	0.094	-0.007	0.080	0.076
Natural Resource Management	0.084	0.077	0.062	-0.004	0.128	0.068	0.060	0.008	0.098	0.079
Food Science	0.022	0.042	0.011	-0.054	-0.014	0.060	0.050	0.026	0.020	0.010
Leadership / Communications	0.105	0.103	0.041	0.087	0.151	0.136	0.074	0.074	0.073	0.091
Other Agricultural Education Subject	-0.162	-0.166	-0.039	-0.170	-0.156	-0.120	-0.721**	-0.175	-0.084	-0.159

* $p < 0.05$, ** $p < 0.01$

^T – Transformed

ME – Management and Entrepreneurship; B – Budgeting; LR – Legal Regulations;

F – Finance; AM – Agribusiness Marketing, RM – Risk Management;

BP – Business Planning; AI – Agribusiness Importance; M – Macroeconomics

Resources

All assumptions were met for multiple linear regression analysis. Two resources were included in each of the 10 models. Five models included having an agribusiness textbook and access to business leaders to use as guest speakers (*Overall Competency* ($R^2 = 0.211$, $F_{2,108} = 14.44$, $p < 0.001$), *Budgeting* ($R^2 = 0.136$, $F_{2,108} = 8.51$, $p < 0.001$), *Finance* ($R^2 = 0.177$, $F_{2,108} = 11.59$, $p < 0.001$), *Business Planning* ($R^2 = 0.225$, $F_{2,108} = 15.69$, $p < 0.001$), and *Agribusiness Importance* ($R^2 = 0.243$, $F_{2,108} = 17.26$, $p < 0.001$)). The remaining five models only used agribusiness textbook as a significant coefficient (*Management and Entrepreneurship* ($R^2 = 0.174$, $F_{1,109} = 22.96$, $p < 0.001$), *Legal Regulations* ($R^2 = 0.158$, $F_{1,109} = 11.07$, $p < 0.001$), *Agribusiness Marketing* ($R^2 = 0.128$, $F_{1,109} = 16.01$, $p < 0.001$), *Risk Management* ($R^2 = 0.144$, $F_{1,109} = 18.40$, $p < 0.001$) and *Macroeconomics* ($R^2 = 0.189$, $F_{1,109} = 25.38$, $p < 0.001$)).

The *Overall Competency* regression model explained 21.1% of the variance associated with the mean competency self-efficacy rating of Mississippi and Tennessee secondary agricultural education teachers. The nine factor models ranged between 12.8% (*Agribusiness Marketing*) and 24.2% (*Agribusiness Importance*) in variance explanation. Table 33 includes means and standard deviations for agribusiness resource availability. R^2 values and equations for each of the multiple linear regression models are found in Table 34. *Resources* β_i coefficients are located in Table 35.

Table 33 Mississippi and Tennessee Secondary Agricultural Teacher Agribusiness Instructional Resource Availability Means and Standard Deviations for the 10 Agribusiness Self-Efficacy variables ($N = 111$)

Resource	Overall	ME	B	LR	F	AM	RM	BP	AI	M
Agribusiness	3.46	3.46	3.79	3.27	3.52	3.46	3.14	3.47	3.77	3.20
Textbook	(0.71)	(0.78)	(0.69)	(0.73)	(0.73)	(0.78)	(0.83)	(0.80)	(0.82)	(0.87)
Agribusiness	3.49	3.49	3.75	3.19	3.66	3.39	3.15	3.53	3.71	3.25
Curriculum	(0.78)	(0.80)	(0.74)	(0.87)	(0.81)	(0.86)	(0.74)	(0.78)	(1.02)	(0.89)
Classroom	3.20	3.17	3.63	2.99	3.30	3.20	2.82	3.49	3.54	2.84
Computer	(0.74)	(0.83)	(0.77)	(0.76)	(0.74)	(0.79)	(0.87)	(0.82)	(0.83)	(0.85)
Access to a	3.28	3.25	3.70	3.09	3.36	3.30	2.96	3.32	3.60	2.97
Computer Lab	(0.79)	(0.89)	(0.76)	(0.75)	(0.79)	(0.86)	(0.88)	(0.91)	(0.85)	(0.93)
Business Leaders	3.35	3.31	3.76	3.11	3.45	3.34	3.01	3.43	3.70	3.02
as Guest Speakers	(0.79)	(0.92)	(0.76)	(0.83)	(0.74)	(0.84)	(0.89)	(0.85)	(0.81)	(0.94)
University	3.26	3.23	3.69	3.01	3.35	3.26	2.92	3.30	3.58	2.93
Extension	(0.87)	(0.97)	(0.83)	(0.88)	(0.83)	(0.94)	(0.95)	(0.94)	(0.92)	(1.00)
Business Leaders										
Serving on	3.34	3.05	3.77	3.07	3.39	3.32	3.02	3.41	3.74	3.02
Advisory	(0.84)	(0.72)	(0.77)	(0.88)	(0.82)	(0.89)	(0.93)	(0.88)	(0.90)	(0.99)
Committee										
Other Agribusiness	3.05	3.11	3.18	2.78	2.91	3.33	2.55	3.67	3.27	2.73
Instructional	(1.67)	(1.81)	(1.82)	(1.67)	(1.42)	(1.75)	(1.68)	(1.73)	(1.47)	(1.62)
Resource										

(Standard Deviations are in parentheses)

ME – Management and Entrepreneurship; B – Budgeting; LR – Legal Regulations;

F – Finance; AM – Agribusiness Marketing, RM – Risk Management;

BP – Business Planning; AI – Agribusiness Importance; M – Macroeconomics

Note: Self-efficacy scores ranged from 1 to 5

Table 34 Multiple Regression Summary on Self Efficacy of 10 Agribusiness Self-Efficacy variables by Mississippi and Tennessee Secondary Agricultural Teachers Agribusiness Instructional Resource Availability ($N = 111$)

Dependent Variable	R^2 Value	Equation
Overall Competency	0.211	0.593(Textbook) + 0.318(Guest Speaker) + 2.802
Management and Entrepreneurship	0.174	0.725(Textbook) + 2.736
Budgeting ^T	0.136	2.669(Guest Speaker) + 2.460(Textbook) + 10.459
Legal Regulations	0.158	0.637(Textbook) + 2.637
Finance	0.177	0.499(Textbook) + 0.357(Guest Speaker) + 2.765
Agribusiness Importance	0.128	0.611(Textbook) + 2.846
Risk Management	0.144	0.685(Textbook) + 2.455
Business Planning	0.225	0.551(Textbook) + 0.519(Guest Speaker) + 2.550
Agribusiness Importance	0.242	0.609(Textbook) + 0.508(Guest Speaker) + 2.796
Macroeconomics	0.189	0.796(Textbook) + 2.404

T – Transformed

Table 35 β_i Coefficients for Agribusiness Instructional Resource Availability of Mississippi and Tennessee Secondary Agricultural Teachers on the 10 Agribusiness Self-Efficacy variables ($N = 111$)

Resource	Overall	ME	B	LR	F	AM	RM	BP	AI	M
Agribusiness Textbook	0.593***	0.725***	2.460*	0.637***	0.499**	0.611***	0.685***	0.551***	0.609***	0.796***
Agribusiness Curriculum	0.022	0.039	-0.019	-0.018	0.081	-0.013	0.029	0.032	-0.022	0.048
Classroom Computer Access to a Computer Lab	-0.062	-0.006	-0.011	-0.045	-0.026	-0.022	-0.07	-0.109	0.036	-0.072
Business Leaders as Guest Speakers	0.098	0.125	0.101	0.119	0.054	0.135	0.134	0.104	0.113	0.123
University Extension Business Leaders	0.318*	0.154	2.66**	0.099	0.357*	0.150	0.166	0.519**	0.508**	0.138
Serving on Advisory Committee	-0.055	0.06	0.012	-0.036	-0.051	0.057	0.049	-0.071	-0.057	0.037
Other Agribusiness Instructional Resource	-0.022	0.066	0.031	-0.014	-0.084	0.053	0.092	-0.004	0.071	0.06
	-0.024	0.025	-0.053	-0.014	-0.082	0.056	-0.024	0.083	-0.047	0.012

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

^T – Transformed

ME – Management and Entrepreneurship; B – Budgeting; LR – Legal Regulations;

F – Finance; AM – Agribusiness Marketing, RM – Risk Management;

BP – Business Planning; AI – Agribusiness Importance; M – Macroeconomics

Business Experience

Assumption analyses resulted in heteroscedasticity issues in the *Overall Competency*, *Management and Entrepreneurship*, *Finance*, and *Business Planning* models. These variables were transformed using squaring (\wedge^2), square root, and logarithmic techniques. Each technique did not resolve the violation of the assumption of homoscedasticity. It was determined to analyze the data in its original state. All other assumptions were met for multiple linear regression analysis.

Overall Competency ($R^2 = 0.119$, $F_{2,108} = 7.28$, $p = 0.001$), *Management and Entrepreneurship* ($R^2 = 0.120$, $F_{2,108} = 7.35$, $p = 0.001$), *Finance* ($R^2 = 0.153$, $F_{2,108} = 9.79$, $p < 0.001$), and *Business Planning* ($R^2 = 0.086$, $F_{2,108} = 5.10$, $p = 0.008$) included Owing a Business and being employed in a Finance Related Position. *Agribusiness Importance* ($R^2 = 0.126$, $F_{2,108} = 7.81$, $p = 0.001$) had Owing a Business and being employed in a Merchandizing Position as significant factors. Finance and Management Positions were significant for *Macroeconomics* ($R^2 = 0.128$, $F_{2,108} = 7.93$, $p = 0.001$). The remaining four models included only Owing a Business as a significant coefficient (*Budgeting* ($R^2 = 0.056$, $F_{1,109} = 6.42$, $p = 0.01$), *Legal Regulations* ($R^2 = 0.070$, $F_{1,109} = 8.14$, $p = 0.005$), *Agribusiness Marketing* ($R^2 = 0.052$, $F_{1,109} = 6.02$, $p = 0.02$), and *Risk Management* ($R^2 = 0.039$, $F_{1,109} = 4.39$, $p = 0.04$)).

Overall Competency regression model explained 11.9% of the variance associated with the variable. The nine factor models ranged between 3.9% (*Risk Management*) and 15.3% (*Finance*) in variance explanation. Table 36 has *Business Experience* means and standard deviations. *Business Experience* R^2 values and equations are located in Table 37. Table 38 includes *Business Experience* β_i coefficients.

Table 36 Mississippi and Tennessee Secondary Agricultural Teachers Business Related Occupational Experience Means and Standard Deviations for the 10 Agribusiness Self-Efficacy variables ($N = 111$)

Resource	Overall	ME	B	LR	F	AM	RM	BP	AI	M
Intern with Company	3.28 (0.91)	3.35 (0.98)	3.58 (0.92)	3.04 (0.88)	3.27 (0.96)	3.24 (0.92)	2.89 (0.96)	3.35 (1.01_)	3.59 (1.02)	3.01 (1.01)
Finance Position	3.99 (0.72)	4.06 (0.74)	3.82 (1.01)	3.63 (1.04)	4.36 (0.37)	3.92 (0.64)	3.57 (0.67)	4.03 (0.83)	4.08 (0.84)	4.04 (0.89)
Sales Position	3.36 (0.78)	3.38 (0.79)	3.66 (0.86)	3.12 (0.81)	3.44 (0.82)	3.38 (0.84)	3.02 (0.95)	3.34 (0.87)	3.68 (0.90)	3.08 (0.92)
Merchandizing Position	3.50 (0.68)	3.51 (0.73)	3.83 (0.69)	3.22 (0.87)	3.51 (0.74)	3.48 (0.81)	3.20 (0.77)	3.63 (0.82)	3.95 (0.85)	3.18 (0.74)
Marketing Position	3.28 (0.61)	3.24 (0.68)	3.65 (0.57)	3.03 (0.64)	3.32 (0.63)	3.32 (0.64)	3.00 (0.82)	3.39 (0.65)	3.80 (0.71)	3.91 (0.88)
Management Position	3.42 (0.75)	3.42 (0.83)	3.74 (0.73)	3.17 (0.87)	3.48 (0.72)	3.42 (0.73)	3.06 (0.93)	3.45 (0.82)	3.82 (0.83)	3.16 (0.83)
Owned a Business	3.48 (0.68)	3.48 (0.78)	3.87 (0.60)	3.30 (0.67)	3.57 (0.65)	3.47 (0.73)	3.10 (0.90)	3.44 (0.85)	3.83 (0.71)	3.15 (0.86)
Owned a Farm	3.27 (0.79)	2.23 (0.88)	3.71 (0.77)	3.06 (0.78)	3.40 (0.77)	3.31 (0.78)	2.92 (0.94)	3.20 (0.86)	3.56 (0.88)	2.95 (0.86)
Other Business Experience	3.15 (0.10)	3.25 (0.45)	3.27 (0.00)	2.84 (0.23)	3.09 (0.25)	3.10 (0.14)	2.84 (0.23)	3.25 (0.11)	3.90 (0.99)	2.75 (0.21)

(Standard Deviations are in parentheses)

ME – Management and Entrepreneurship; B – Budgeting; LR – Legal Regulations;

F – Finance; AM – Agribusiness Marketing, RM – Risk Management;

BP – Business Planning; AI – Agribusiness Importance; M – Macroeconomics

Note: Self-efficacy scores ranged from 1 to 5

Table 37 Multiple Regression Summary on Self Efficacy of 10 Agribusiness Self-Efficacy variables by Mississippi and Tennessee Secondary Agricultural Teachers Business Related Occupational Experience ($N = 111$)

Dependent Variable	R^2 Value	Equation
Overall Competency	0.119	0.821(Finance Position) + 0.436(Owning a Business) + 2.998
Management and Entrepreneurship	0.120	0.922(Finance Position) + 0.474(Owning a Business) + 2.953
Budgeting ^T	0.056	0.2.679(Owning a Business) + 12.646
Legal Regulations	0.070	0.447(Owning a Business) + 2.849
Finance	0.153	1.113(Finance Position) + 0.421(Owning a Business) + 3.083
Agribusiness Marketing	0.052	0.414(Owning a Business) + 3.059
Risk Management	0.039	0.375(Owning a Business) + 2.722
Business Planning	0.086	0.860(Finance Position) + 0.372(Owning a Business) + 3.025
Agribusiness Importance	0.126	0.539(Owning a Business) + 0.525(Merchandizing Position) + 3.221
Macroeconomics	0.128	1.277(Finance Position) + 0.442(Management Position) + 2.675

T – Transformed

Table 38 β_i Coefficients for Mississippi and Tennessee Secondary Agricultural Teachers Business Related Occupational Experience on the 10 Agribusiness Self-Efficacy variables ($N = 111$)

Experience	Overall	ME	B	LR	F	AM	RM	BP	AI	M
Intern with Company	0.051	0.115	0.001	0.032	-0.054	0.024	0.028	0.094	0.076	0.052
Finance Position	0.821*	0.922*	0.069	0.165	1.113**	0.179	0.169	0.860*	0.134	1.277**
Sales Position	0.125	0.148	0.070	0.092	0.104	0.144	0.125	0.091	0.110	0.088
Merchandizing Position	0.128	0.129	0.099	0.09	0.083	0.112	0.138	0.167	0.525**	-0.002
Marketing Position	0.026	0.015	-0.009	0.003	-0.002	0.045	0.057	0.073	0.105	0.442
Management Position	0.131	0.137	0.041	0.051	0.108	0.1	0.094	0.149	0.093	-0.053*
Owned a Business	0.436**	0.474**	2.679*	0.447**	0.421**	0.414**	0.375**	0.372*	0.539**	0.159
Owned a Farm	0.075	0.058	0.106	0.032	0.124	0.088	0.045	-0.012	0.054	0.085
Other Business Experience	0.026	0.047	-0.05	-0.002	0.001	0.007	0.017	0.036	0.107	0.011

* $p < 0.05$, ** $p < 0.01$

T – Transformed

ME – Management and Entrepreneurship; B – Budgeting; LR – Legal Regulations;

F – Finance; AM – Agribusiness Marketing, RM – Risk Management;

BP – Business Planning; AI – Agribusiness Importance; M – Macroeconomics

Professional Development

All other assumptions were met for multiple linear regression analysis. All 10 multiple regressions resulted in single significant coefficients. Other Professional Association provided a significant coefficient for the transformed *Budgeting* model ($R^2 = 0.061$, $F_{1,109} = 7.03$, $p = 0.009$). The remaining nine models only included State Department of Education as a significant coefficient (*Overall Competency* ($R^2 = 0.131$, $F_{1,109} = 16.45$, $p < 0.001$), *Management and Entrepreneurship* ($R^2 = 0.125$, $F_{1,109} = 15.57$, $p < 0.001$), *Legal Regulations* ($R^2 = 0.115$, $F_{1,109} = 14.23$, $p < 0.001$), *Finance* ($R^2 = 0.158$, $F_{1,109} = 20.52$, $p < 0.001$), *Agribusiness Marketing* ($R^2 = 0.131$, $F_{1,109} = 11.21$, $p = 0.001$), *Risk Management* ($R^2 = 0.136$, $F_{1,109} = 17.19$, $p < 0.001$), *Business Planning* ($R^2 = 0.075$, $F_{1,109} = 8.85$, $p = 0.004$), *Agribusiness Importance* ($R^2 = 0.103$, $F_{1,109} = 12.50$, $p = 0.001$), and *Macroeconomics* ($R^2 = 0.143$, $F_{1,109} = 18.25$, $p < 0.001$)).

The regression model for *Overall Competency* explained 13.1% of the variance associated with agribusiness competency self-efficacy rating of Mississippi and Tennessee secondary agricultural education teacher participants. The nine factor models range between 6.1% (*Budgeting* model) and 15.8% (*Finance* model) in variance explanation. Means and standard deviations are in Table 39. R^2 values and equations for *Professional Development* are located in Table 40. *Professional Development* β_i coefficients are found in Table 41

Table 39 Professional Development Sources Means and Standard Deviations for Mississippi and Tennessee Secondary Agricultural Teachers (N = 111)

Source	Overall	ME	B	LR	F	AM	RM	BP	AI	M
State Department of Education	3.43 (0.72)	3.42 (0.78)	3.74 (0.76)	3.23 (0.75)	3.55 (0.71)	3.42 (0.76)	3.14 (0.84)	3.39 (0.83)	3.71 (0.82)	3.16 (0.87)
USDE	3.42 (0.87)	3.40 (0.98)	3.81 (0.85)	3.88 (0.85)	3.53 (0.64)	3.58 (0.65)	3.04 (1.15)	3.15 (1.00)	3.67 (0.91)	3.22 (1.09)
State Association of Agricultural Educators	3.34 (0.74)	3.34 (0.82)	3.73 (0.87)	3.13 (0.76)	3.41 (0.76)	3.30 (0.81)	3.00 (0.83)	3.37 (0.85)	3.59 (0.83)	3.05 (0.88)
NAAE	3.54 (0.68)	3.58 (0.75)	3.84 (0.68)	3.19 (0.69)	3.55 (0.62)	3.59 (0.65)	3.22 (0.84)	3.57 (0.88)	3.81 (0.78)	3.29 (0.81)
Other Professional Organization	3.51 (0.71)	3.47 (0.82)	4.01 (0.61)	3.28 (0.78)	3.65 (0.68)	3.46 (0.76)	3.15 (0.87)	3.33 (0.72)	3.81 (0.65)	3.29 (0.95)
Private Industry	3.56 (0.74)	3.55 (0.81)	3.84 (0.71)	3.39 (0.72)	3.41 (0.77)	3.55 (0.69)	3.31 (0.73)	3.37 (0.86)	3.84 (0.83)	3.36 (0.85)
Land Grant University	3.42 (0.72)	3.47 (0.77)	3.73 (0.72)	3.14 (0.78)	3.54 (0.80)	3.38 (0.79)	3.06 (0.81)	3.33 (0.84)	3.74 (0.88)	3.15 (0.84)
Non Land Grant University	3.70 (0.72)	3.74 (0.78)	4.01 (0.71)	3.82 (0.74)	3.82 (0.74)	3.58 (0.64)	3.40 (0.75)	3.52 (0.83)	4.00 (0.85)	3.50 (0.75)
State Department of Agriculture	3.47 (0.83)	3.46 (0.87)	3.76 (0.86)	3.26 (0.90)	3.57 (0.78)	3.56 (0.75)	3.33 (0.85)	3.32 (0.84)	3.67 (1.00)	3.27 (1.03)
USDA	3.60 (0.49)	3.66 (0.53)	3.77 (0.59)	3.24 (0.64)	3.64 (0.58)	3.64 (0.52)	3.32 (0.61)	3.41 (0.46)	3.91 (0.70)	3.58 (0.50)
Other Professional Development Source	3.57 (0.57)	3.50 (0.58)	4.16 (0.40)	3.33 (0.49)	3.96 (0.66)	3.52 (0.46)	2.70 (0.83)	3.67 (0.88)	3.60 (0.66)	3.30 (0.94)

(Standard Deviations are in parentheses)

ME – Management and Entrepreneurship; B – Budgeting; LR – Legal Regulations;

F – Finance; AM – Agribusiness Marketing, RM – Risk Management;

BP – Business Planning; AI – Agribusiness Importance; M – Macroeconomics

Note: Self-efficacy scores ranged from 1 to 5

Table 40 Multiple Regression Summary on Self Efficacy of 10 Agribusiness Self-Efficacy variables by Mississippi and Tennessee Secondary Agricultural Teachers Professional Development Sources ($N = 111$)

Dependent Variable	R^2 Value	Equation
Overall Competency	0.131	$0.572(\text{State Department of Education}) + 2.857$
Management and Entrepreneurship	0.125	$0.312(\text{State Department of Education}) + 2.806$
Budgeting ^T	0.061	$3.477(\text{Other Professional Organization}) + 12.919$
Legal Regulations	0.115	$0.544(\text{State Department of Education}) + 2.690$
Finance	0.158	$0.632(\text{State Department of Education}) + 2.917$
Agribusiness Marketing	0.093	$0.521(\text{State Department of Education}) + 2.902$
Risk Management	0.136	$0.664(\text{State Department of Education}) + 2.473$
Business Planning	0.075	$0.476(\text{State Department of Education}) + 2.919$
Agribusiness Importance	0.103	$0.564(\text{State Department of Education}) + 3.143$
Macroeconomics	0.143	$0.692(\text{State Department of Education}) + 2.469$

T – Transformed

Table 41 β_i Coefficients for Mississippi and Tennessee Secondary Agricultural Teachers Professional Development Sources on the 10 Agribusiness Self-Efficacy variables ($N = 111$)

Source	Overall	ME	B	LR	F	AM	RM	BP	AI	M
State Department of Education	0.572***	0.613***	0.174	0.544***	0.632***	0.521**	0.664***	0.476**	0.564**	0.692***
USDE	-0.004	-0.008	0.019	0.018	-0.009	0.059	-0.036	-0.091	-0.015	0.021
State Association of Agricultural Educators	0.117	0.15	0.168	0.071	0.035	0.015	0.06	0.176	0.055	0.11
NAAE	0.153	0.182	0.134	0.029	0.079	0.178	0.126	0.175	0.131	0.156
Other Professional Organization	0.108	0.086	3.477**	0.081	0.122	0.071	0.064	0.008	0.108	0.128
Private Industry	0.115	0.11	0.057	0.129	0.139	0.079	0.131	0.018	0.103	0.142
Land Grant University	0.093	0.135	0.062	0.01	0.097	0.048	0.044	0.02	0.114	0.089
Non Land Grant University	0.101	0.112	0.066	0.045	0.102	0.053	0.086	0.043	0.100	0.111
State Department of Agriculture	0.045	0.04	0.041	0.031	0.035	0.088	0.117	-0.02	-0.001	0.072
USDA	0.094	0.11	-0.021	0.026	0.062	0.102	0.087	0.023	0.095	0.168
Other Professional Development Source	0.071	0.052	0.131	0.058	0.151	0.052	-0.075	0.094	0.002	0.067

** $p < 0.01$, *** $p < 0.001$

^T – Transformed

ME – Management and Entrepreneurship; B – Budgeting; LR – Legal Regulations;

F – Finance; AM – Agribusiness Marketing, RM – Risk Management;

BP – Business Planning; AI – Agribusiness Importance; M – Macroeconomics

Years of Experience

The Shapiro-Wilk test for years of experience (*Experience*) was significant (0.866, $df = 111$, $p < 0.001$) for each of the confidence variables. The relationship of *Experience* to the *Agribusiness Self-Efficacy* variables was conducted using Spearman's r_s .

The participants' years of *Experience* was significantly related to one of the 10 *Agribusiness Self-Efficacy* variables. *Finance* and *Experience* ($r_s = 0.213$, $p = 0.025$) exhibit a significant relationship. All correlations had a small effect size. Results for Spearman's correlation tests are found in Table 42.

Table 42 Spearman's Coefficient for Mississippi and Tennessee Secondary Agricultural Teachers Years of Experience and the 10 Agribusiness Self-Efficacy variables ($N = 111$)

Variable	r_s	p
Overall Competency	0.093	0.333
Management and Entrepreneurship	0.067	0.484
Budgeting	0.056	0.562
Legal Regulations	0.110	0.248
Finance	0.213	0.025
Agribusiness Marketing	0.049	0.613
Risk Management	0.094	0.328
Business Planning	0.026	0.785
Agribusiness Importance	0.116	0.227
Macroeconomics	0.055	0.564

Age

The relationship between *Age* and the *Agribusiness Self-Efficacy* variables was conducted using Spearman's r_s because of a violation of the assumption of normality. The Shapiro-Wilk test for *Age* provided a significant result (0.947, $df = 111$, $p < 0.001$).

The participants' *Age* was not significantly related to any of the 10 *Agribusiness Self-Efficacy* variables. All correlations had a small effect size. Results for *Age* Spearman's correlation tests are found in Table 43.

Table 43 Spearman's Coefficient for Mississippi and Teacher Secondary Agricultural Teachers Age and the 10 Agribusiness Self-Efficacy variables ($N = 111$)

Variable	r_s	p
Overall Competency	0.048	0.620
Management and Entrepreneurship	0.033	0.733
Budgeting	-0.005	0.958
Legal Regulations	0.145	0.129
Finance	0.176	0.065
Agribusiness Marketing	0.010	0.920
Risk Management	0.056	0.560
Business Planning	-0.060	0.533
Agribusiness Importance	0.085	0.375
Macroeconomics	0.017	0.863

CHAPTER V

CONCLUSIONS, DISCUSSIONS AND RECOMMENDATIONS

This chapter provides a summary results from Chapter IV, conclusions from the study, recommendations for use, and needs for further research.

Purpose of the Study

The purpose of this study was to determine agricultural teacher self-efficacy based on Mississippi and Tennessee agricultural education standards developed from the Agribusiness Systems Career Pathway of the National Agriculture, Food, and Natural Resources Career Cluster Content Standards (2015). The study also examined if teacher agribusiness self-efficacy is related to such as coursework completed in college, years of experience, age, post-secondary major, post-secondary grade point average, type of teacher certification (alternate vs. traditional), highest degree completed, secondary agricultural courses taught, business related occupation experiences, professional development participation, and resources available to teach agribusiness.

Findings and Discussion

Research Objective One (Demographics)

Identify demographic information such as coursework completed in college, years of experience, post-secondary major, post-secondary grade point, average, type of teacher certification (alternate vs. traditional), highest degree completed, secondary agricultural courses

taught, business related occupational experiences, professional development attended, and resources available to teach agribusiness.

Introduction to Agribusiness was the most common business related course taken by the teachers followed Macroeconomics and Microeconomics. Agriculturally related degrees commonly require introductory courses to the various agricultural disciplines. Macroeconomics and Microeconomics were common courses taken by undergraduate students.

Teachers completed an average of 4.68 collegiate level business related courses with a range of 0 to 36 courses completed. No research was discovered to enable a comparison of the number of collegiate business related courses by the teachers to another group. The individuals who responded with 32 courses and 36 courses appear to be high but could be explained by various possibilities. Their high number of courses could be due to completing degrees at universities using quarter system instead of semesters. Both teachers have advanced degrees, and the case with 36 business related courses had an undergraduate major of Agricultural Economics.

All teachers had at least a bachelor's degree. Even with a shortage of traditionally certified secondary agricultural teachers to meet the demand, school districts are likely to hire individuals who have a bachelor's degree in another agricultural area or individuals who are traditionally certified in another subject area over individuals who do not have a bachelor's degree.

The most common undergraduate major for the participants is Agricultural Education followed by Animal Science. A vast majority of the participants majored in an agriculturally related area. Agricultural Education can be assumed to be a common undergraduate major for secondary agricultural education teachers because it is designed to prepare future teachers.

Agricultural education is the most common graduate major as well. Most (73.5%) of the participants with graduate majors majored in Agricultural Education, Education with an emphasis in Instruction, or Education with an emphasis in Administration. Secondary agricultural education teachers are likely to select an educationally related major if they plan to continue in the profession. Also, these three majors might also include individuals who decided to teach after completed a bachelor's degree in another major.

Teachers' undergraduate grade point average was spread across the ranges. Most of the teachers had an undergraduate GPA between 3.00 – 3.49. All but one of the teachers had an undergraduate GPA above 2.50. Many educational programs require a minimum GPA to be enrolled in the program and/or student teach. Reviewing the responses, the research discovered that the single case below 2.50 was alternatively certified.

Most of the teachers had a traditional certification (57.7%) with 42.3% of the participants having an alternative certificate. Other agricultural education research in the area of certification type indicated a wider margin between the two groups. Robinson and Edwards (2012) reported first year agricultural education teachers in Oklahoma were 73.9% traditionally certified and 26.1% alternatively certified. Lawver and Smith (2014) reported 88.4% traditionally certified and 11.6% alternatively certified agricultural education teachers in Utah.

Agriscience is the most common course that was taught by the teachers. Agriscience courses are popular courses because they allow students to obtain a science credit while studying agricultural. Agriscience is also considered an entry level course for agricultural education pathways in Tennessee (TDOE, 2019). Food science is the least selected course option which was hypothesized because it is a relatively new pathway in Tennessee.

The types of instructional resources available to teach agribusiness reported by the participants provided some surprising results. Sixty-nine participants report using university extension as a resource to teach agribusiness topics. Even though extension programs in Mississippi and Tennessee along with other states have a multitude of agribusiness publications and include business related topics in many of extension programs, not all teachers are utilizing those resources. Only 82 participants indicated a classroom computer in which students can use. While this is approximately three-fourths of the teachers, the study does not account for teachers who have a classroom computer where students are not allowed to use.

The most selected business related occupational experience by the teachers is owning and operating a personal farm. Owning a personal business and having a sales position within a company are the second most reported occupational experiences. Many secondary agricultural teachers participate in farming operations. Thirty-four teachers interned with a company. The researched suspects that most of the internship occurred while to teachers were in college as a means to gain experience as well as raise funds to pay for college tuition.

The teachers indicated that they have received most of their agribusiness professional development from programs present by the state agricultural education teachers associations and the state department of education. Both Mississippi and Tennessee provide agricultural education professional development conferences in July. These conferences were previously conducted by the state department of education but are currently conducted by the state associations of agricultural educators. Future studies might find increases in state professional organization professional development participation.

On average the teachers had 11.78 years of experience teaching secondary agricultural education. This mean is consistent with the findings by Rice and Kitchel (2015) where they reported an average 12.77 years of experience for agricultural education teachers in their study.

Research Objective Two

Determine major agribusiness themes using Mississippi and Tennessee agricultural education state competencies.

Factor analysis divided the 88 state agribusiness course competencies into nine groups. The largest grouped contained 28 competencies with the two smallest groups containing 5. The researcher had hoped that the groups would have been closer in size.

The diversity of the largest group (*Management and Entrepreneurship*) added difficulty to discovering a common theme.

The construct themes are similar to major themes in agribusiness education. Reviewing agribusiness course competencies from Mississippi and Tennessee, the themes are similar to the units from the courses. However, some competencies were grouped differently than what leaders from both states have published.

The themes discovered in the study are different from the themes from the pilot study. Even though the researcher desired that the study and pilot study would produce similar results, the findings are not surprising. The differences in factor constructs between the pilot study and the final study are attributed to differences in sample size.

Research Objective Three

Determine agricultural education teacher agribusiness self-efficacy using Mississippi and Tennessee agricultural education state competencies.

Secondary agricultural education teachers rated their confidence to teach Mississippi and Tennessee secondary agribusiness course competencies on a scale of 1 to 5. The mean overall teacher agribusiness self-efficacy rating was 3.18 out of 5. The teachers reported a mean rating of somewhat confident to teach state agribusiness course competencies based on the 5 point scale.

The review of factor construct means result in similar conclusions. Most factor means fell between 2.51 and 3.49, which would indicate that the participants were somewhat confident to teach the competencies within the theme. *Budgeting* resulted in a confident level with a mean of 3.59. Participants use the concepts associated with *Budgeting* competencies in their personal financial decision making. *Agribusiness Importance* had the second highest mean among the nine factors. The competencies associated with *Agribusiness Importance* include concepts are not as detailed as other competencies. Three themes resulted in confidence means below three, *Legal Regulations* (2.99), *Macroeconomics* (2.86), and *Risk Management* (2.84). The competencies in these factors require a greater agribusiness understanding. The increased knowledge requirement may attribute to lower confidence to teach.

Research Objective Four

Discover if a relationship exists between teacher agribusiness self-efficacy and various demographics.

The types of collegiate level business related courses have a moderate effect on agribusiness self-efficacy. This is consistent with research that suggests collegiate courses can influence teacher self-efficacy (McKim & Velez, 2017; Tschannen-Moran & Hoy, 2007; Watters & Ginns, 1995). Marketing courses are included in nine of the ten models, Introduction to Agribusiness courses are included in six of the models, Microeconomics courses are included

in four of the models, Farm Management course are included in two of the models, Finance courses are included in one model, Business Law courses are included in one model. It is concluded that preservice agricultural education students take a Marketing course and an Introduction to optimize agribusiness self-efficacy.

Analysis of the multiple linear regression results raised some issues. The R^2 values indicated that the regression models explained less than 20% of the variance. The *Macroeconomics* (6.1%) result is especially low. While R^2 values are typically lower when attempting to predict human behavior, the researcher desired for the explain more of the variance. Macroeconomics course was not included in the *Macroeconomics* result and Business Law was not included in *Legal Regulations* result. Factors were named without consideration of Objective Four results.

The number of collegiate business related courses completed were moderately related to agribusiness self-efficacy. While taking more business related collegiate courses increases confidence to teach agribusiness competencies, the moderate correlation indicates teachers would react differently by taking an additional course. The amount of increase in teacher agribusiness self-efficacy with an additional business related course would also be dependent on the type of course. Further research should be conducted as to the optimal number of courses to complete at the collegiate level.

With the exception of transformed *Budgeting*, the participants' agribusiness self-efficacy did not significantly differ between different levels of education. This was consistent with research in other areas of teacher self-efficacy (Guenther, 2014; Sture, 2014; Tschannen-Moran & Johnson, 2011). While obtaining higher levels of education does provide personal and

professional benefits to teachers, it does not increase teacher's confidence to teach agribusiness competencies.

Agribusiness self-efficacy did not significantly differ based on undergraduate or graduate major. Limited agricultural education research was discovered comparing self-efficacy across majors; however, it is consistent with the findings of Evans (2010) in mathematics. It was surprising to the researcher that agribusiness undergraduate majors were not significantly higher than the other majors. However, any differences would be attributed to the assumption that agribusiness majors would complete more business related courses as compared to other majors.

Seven of the dependent variables were significantly different between the grade point average groups. However, post hoc analysis produces startling results. Agribusiness self-efficacy for the highest GPA group (3.50 – 4.00) was significantly lower than the middle range group (3.00 – 3.49) in six of the seven significant tests. The lowest GPA group (below 3.00) had a significantly higher agribusiness self-efficacy than the highest GPA group. These were unexpected results. The researcher assumed higher GPA's would result in higher confidence levels. Further research should be conducted to determine if teachers with higher GPA levels have significantly lower self-efficacy or if this is a unique situation only occurring with the participants of this study.

Agribusiness self-efficacy did not significantly differ between traditionally and alternatively certified participants. This result is consistent with the research of Fox and Petters (2013) and Rocca and Washburn (2005). Rocca and Washburn (2005) suggested lack of significant differences in teacher self-efficacy between traditionally and alternatively certified teachers was because traditionally certified teacher were more critical of themselves.

The courses in which the participants have taught or are currently teaching have a moderate effect on agribusiness self-efficacy. Agribusiness was included in all ten models. Other Agricultural Subject was included in one model. The relationship between teaching Agribusiness and agribusiness self-efficacy was consistent with research (Ross et al., 1999; Tschannen-Moran, Hoy, & Hoy, 1998).

Even though all ten models were significant, R^2 values indicated that less than 15% of the variance was explained by the courses taught by the participants. Participants who have taught Agribusiness courses should have a high agribusiness self-efficacy as compared to participants who have not. Other variables explained more of the variation in teaching agribusiness competencies than the subject taught by the participants.

Another intriguing result of classes taught by the participants analysis was found in the *Risk Management* model. Other Agricultural Subject resulted in negative value, meaning it is predicted to decrease a teacher's confidence to teach agribusiness risk management competencies. Lower self-efficacies were associated with negative experiences. *Risk Management* had the lowest mean of the nine themes. Participants who taught the other agricultural subjects provided a low confidence for the competencies associated with *Risk Management*. This was the only time a significant negative regression coefficient was discovered in the study. The researcher was surprised it was not more common with *Risk Management* and *Macroeconomics* factors, the two factors with the lowest means.

Participants' agribusiness self-efficacy was impacted by the resources available to teach the material. All models include having access to an agribusiness textbook. Five of the ten models included using business leaders as guest speakers. When a secondary agricultural education teacher is unfamiliar or unsure about an agribusiness related topic, they can refer to

agribusiness textbook in hopes to gain a greater understanding. Guest speakers offer a different perspective to instructional material. Guest speakers bring experiences and expertise that will enhance a secondary agricultural education teacher's instruction. R^2 values ranged between 0.136 (*Budgeting*) and 0.242 (*Agribusiness Importance*). Resources availability multiple linear regression resulted in the highest amount of variance explained of all the independent variables. While higher amounts of variance explanation is desired, the researcher concluded that having teachers should maintain a professional library and use guest speakers as needed to enhance agribusiness self-efficacy.

Agribusiness self-efficacy was influenced by four business related occupational experiences. Owning a business was included in nine of the ten models. Five models include being employed in a finance related occupation. Management and merchandizing experiences were included in at least one model. The amount of variance explained by business related experiences was low ranging from 3.9% (*Risk Management*) and 15.3% (*Finance*). Most of the variance associated with teacher agribusiness self-efficacy was explained by other factors.

The source of agribusiness professional development moderately effected participants' agribusiness self-efficacy rating. Professional development offered by the state department of education was the sole factor in nine of the multiple regression equations. Budgeting model only included other professional associations. The impact of state department of education agribusiness professional development was expected because summer agricultural education summer conferences are traditionally facilitated by the agricultural education division of the state department of education. The influence of the state department of education professional development may change over the course of the next several years as state associations of

agricultural educators taking a larger role in providing agricultural education professional development in the study area.

Professional development sources only explained a limited amount of the agribusiness self-efficacy variance similar to the remaining models in the study. Throughout the study, multiple linear regression analysis resulted in low explanations in the variation associated with the overall model and nine factor models. Other factors beyond the study attributed to teacher agribusiness self-efficacy.

The mean of Finance construct competencies was the only dependent variable that was significantly related to the participants' years of teaching experience. Previous research varies as to the relationship between teacher self-efficacy and years of experience. Burris et al. (2010) suggested the differences in findings may be a result of how teacher self-efficacy is measured, how teacher self-efficacy is defined, or when what stage of a teacher's career that the teacher self-efficacy is measured.

The participants' agribusiness self-efficacy was not statistically related to the participants' age. This confirms previous research regarding the relationship between teacher self-efficacy and age (Colomeishi & Colomeishi, 2014; Penrose, Perry, & Ball, 2007, Tschannen-Moron & Woolfolk Hoy, 2007; and Bandura, 1994).

Conclusion

Bandura (1994) wrote that an individual's self-efficacy impacts how they are motivated, how they behave, and how they perform. Teachers are more likely to perform better in areas where they are confident and avoid topics where they lack confidence. Self-efficacy can change throughout a person's life. Teachers should participate in positive cognitive development activities and use constructive feedback in hopes to increase their teacher self-efficacy.

This study concludes that the teachers are somewhat confident to teach agribusiness. While a level of somewhat confident is better than little or no confidence, it does indicate that participants lack confidence in teaching agribusiness competencies. The lack of confidence to teach agribusiness competencies could lessen a teacher's classroom performance. Teachers are more likely to spend time and effort on concepts they are confident with, such as budgeting and inductor topics, as compared to concepts they lack confidence, such as government regulations and risk management.

The variation of confidence in topics is confirmed by analysis of means of the different factors. Throughout the study, *Budgeting* and *Agribusiness Importance* demonstrated the highest competency mean ratings and *Macroeconomics*, *Risk Management*, and *Legal Regulations* exhibited the lowest competency mean ratings. The remaining four factors, *Management and Entrepreneurship*, *Finance*, *Agribusiness Marketing*, and *Business Planning*, were consistently located between the highest two and lowest three themes. While this study did not attempt to determine causation between the factor differences, it is concluded that teachers are most confident to teach the competencies from *Agribusiness Importance* and *Budgeting* and least confident to teach competencies from *Macroeconomics*, *Risk Management*, and *Legal Regulations*. The lack of confidence in those areas could lesson a teacher's classroom performance levels.

The lack of variance explanation from the multiple linear regression analysis raises some issues. Instructional resource availability regression models had the highest explanation of variance for all models besides *Legal Regulations* and *Agribusiness Marketing*. Collegiate business related courses explained most of the variance for *Legal Regulations* and *Agribusiness Marketing*. Subjects taught by the participants and business related experiences explained the

least amount of variance. It is concluded that that agribusiness instructional resource availability the best indicator of teacher agribusiness self-efficacy based on this study. However, there are other extenuating factors beyond this study that is influencing the participants' confidence to teacher agribusiness competencies.

Preservice secondary agricultural education teachers are limited to the number of collegiate level courses they take during their undergraduate pursuits. University agricultural education officials are tasked with developing the proper course of study for future secondary agricultural education teachers. Adding courses in one area will reduce courses in other areas. Based on the results of this study, it is concluded that agricultural education professors consider requiring at least an introductory to agribusiness course and a marketing course as part of degree requirements for preservice secondary agricultural education students.

Limitations

This study is limited by the following factors:

1. The results cannot be generalized beyond the study area due to the sample consisting only of agricultural education teachers from Mississippi and Tennessee.
2. An instrument was created to assess teacher agribusiness self-efficacy. Bias can exist in research-created instruments.
3. Agricultural education teachers self-reported information for the study. Self-reported data can lead to selective memory and exaggeration.
4. The descriptive correlational design of the study limits the opportunity to determine a cause and effect relationship.

5. The study has a 24.8% response rate. Response rate could have been influenced by timing of data collection and potential participants work load. Increasing the number in the study may have increased the effect sizes observed.

Recommendations for Further Research

The following recommendations for research are made based upon the findings of this study:

1. Additional research is needed to determine the optimal number of collegiate business related courses as it influences agribusiness self-efficacy. Research should also include how increases in collegiate business related courses will impact teacher self-efficacy in other agricultural content areas.
2. Further research should be conducted with teacher collegiate grade point average as a predictor of teacher self-efficacy to determine if the observed differences between the GPA levels is only unique to this study.
3. More research is needed not only in agribusiness content self-efficacy but in all areas of agricultural content self-efficacy to determine how it influences secondary agricultural education teachers' ability to prepare future agricultural leaders.
4. While this study determined significant topics that influence teacher agribusiness self-efficacy, 75% of the variation was not explained. Additional research is needed to determine what additional factors account for the remaining sources of variation in teacher agribusiness self-efficacy.

Recommendations for Practice

The following recommendations are made based upon the findings:

1. Agricultural colleges and universities in Mississippi and Tennessee should consider requiring an introductory agribusiness course and a marketing course for students interested in teaching secondary agricultural education.
2. State departments of education in Mississippi and Tennessee should offer agribusiness professional development to enhance teacher's confidence in the teaching agribusiness topics.
3. Secondary agricultural education teachers should maintain a professional library including agribusiness textbooks to optimize content related self-efficacy.
4. Secondary agricultural education teachers should develop relationships with local business leaders and use the business leaders as guest leaders to enhance instruction and offset deficiencies in agribusiness content self-efficacy.

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APPENDIX A
MISSISSIPPI STATE UNIVERSITY INSTITUTIONAL REVIEW
BOARD (IRB) ACCEPTANCE



Michael Vestal <wmv20@msstate.edu>

Approval Notice for Study # IRB-17-730, Secondary agricultural teacher self-efficacy in agribusiness and the relationship to collegiate course work

1 message

prm199@msstate.edu <prm199@msstate.edu> Mon, Apr 16, 2018 at 4:59 PM
To: kas103@msstate.edu, cbj170@msstate.edu, khc3@msstate.edu, men1@msstate.edu,
wmv20@msstate.edu

Protocol ID: IRB-17-730
Principal Investigator: Kirk Swortzel
Protocol Title: Secondary agricultural teacher self-efficacy in agribusiness and the relationship to collegiate course work
Review Type: EXEMPT
Approval Date: April 16, 2018
Expiration Date: April 15, 2023

The above referenced study has been approved. To access your approval documents, log into myProtocol and click on the protocol number to open the approved study. Your official approval letter can be found under the Event History section. For non-exempt approved studies, all stamped documents (e.g., consent, recruitment) can be found in the Attachment section and are labeled accordingly.

If you have any questions that the HRPP can assist you in answering, please do not hesitate to contact us at irb@research.msstate.edu or 662.325.3994.

APPENDIX B
INSTURMENT

Agricultural teacher agribusiness teaching self-efficacy

Question 1_1

Many states offer agribusiness courses as part of their agricultural education career pathway. Other states integrate agribusiness concepts and principles in other agricultural education courses. Reflect on your ability to teach the following competencies using the following scale: **No Confidence** in teaching the competency, **Little Confidence** in the teaching the competency, **Somewhat Confident** in teaching the competency, **Confident** in teaching the competency, and **Very Confident** in teaching the competency.

Competency	Select one level of confidence for each competency.				
	No Confidence (1)	Little Confidence (2)	Somewhat Confident (3)	Confident (4)	Very Confident (5)
Explore the concept and principles of entrepreneurship.					
Understand the scope and importance of agribusiness.					
Describe the characteristics and functions of various financial institutions.					
Explore banking services for personal and business accounts.					
Explore concepts of credit.					
Compare loan options.					
Investigate the concepts of risk and insurance.					
Describe basic record-keeping principles.					
Compare types of accounting and bookkeeping systems used in agribusiness.					
Maintain income and expense records.					
Apply basic inventory principles.					
Establish inventory values.					
Understand the various types of investment opportunities.					
Examine a balance sheet (i.e., net worth statement).					
Examine an income statement.					
Examine a cash flow statement.					
Examine the importance of personal budgeting.					
Prepare an enterprise budget, a partial budget, and a cash flow budget related to selected agribusiness scenarios.					
Project annual income based on different hourly wages.					
Explain agribusiness marketing.					
Describe the types of markets used to sell agricultural products.					
Describe various types of agribusinesses.					
Understand the principles of business management.					

Question 1_2

Many states offer agribusiness courses as part of their agricultural education career pathway. Other states integrate agribusiness concepts and principles in other agricultural education courses. Reflect on your ability to teach the following competencies using the following scale: **No Confidence** in teaching the competency, **Little Confidence** in the teaching the competency, **Somewhat Confident** in teaching the competency, **Confident** in teaching the competency, and **Very Confident** in teaching the competency.

Competency	Select one level of confidence for each competency.				
	No Confidence (1)	Little Confidence (2)	Somewhat Confident (3)	Confident (4)	Very Confident (5)
Plan and manage career-development options in agribusiness.					
Understand budgeting and recordkeeping procedures in an agribusiness.					
Assess financial standing in an agribusiness using financial records.					
Manage personal income taxes.					
Manage business taxes.					
Describe common legal issues and documents and their applications.					
Describe legal requirements for a business.					
Describe safety and health regulations related to agribusinesses.					
Distinguish among basic economic principles in agribusiness.					
Explain an agribusiness enterprise.					
Apply economic principles as they relate to business management.					
Differentiate between macroeconomics and microeconomics in agribusiness.					
Assess financial risk factors in agribusiness management.					
Discuss risks associated with capital resources in agribusiness.					
Evaluate production risks associated with agribusiness management.					
Identify the types, methods, and resources for insuring various types of agribusinesses.					
Describe and apply the decision-making process.					
Describe principles related to the acquisition and use of capital.					
Prepare a budget for a given enterprise.					
Evaluate a business plan for an agricultural enterprise.					
Develop a concept for an agribusiness.					
Construct specific, measurable, attainable, realistic, and timely (SMART) goals for the agribusiness.					
Prepare a business plan for the agribusiness.					
Develop a basic marketing plan for a local business.					

Question 1_3

Many states offer agribusiness courses as part of their agricultural education career pathway. Other states integrate agribusiness concepts and principles in other agricultural education courses. Reflect on your ability to teach the following competencies using the following scale: **No Confidence** in teaching the competency, **Little Confidence** in the teaching the competency, **Somewhat Confident** in teaching the competency, **Confident** in teaching the competency, and **Very Confident** in teaching the competency.

Competency	Select one level of confidence for each competency.				
	No Confidence (1)	Little Confidence (2)	Somewhat Confident (3)	Confident (4)	Very Confident (5)
Explore international marketing opportunities.					
Explain agribusiness retailing.					
Explain the sales process.					
Identify various types of advertising involved in agriculture.					
Utilize the concepts of sales and marketing to plan and execute a marketing and public relations plan that promotes agricultural products and services that meet the needs of customers.					
Discuss the function of agribusiness management and its impact on risk and cultural environments.					
Apply basic principles of economics to the management and administration of a selected business.					
Manage a school-based business venture.					
Apply principles of business ethics.					
Explore human resources management.					
Explore and compare local, regional, state, national, and global career opportunities in the agribusiness industry.					
Examine specific business practices, laws, regulations, and technologies that have evolved within the agribusiness sector, and evaluate the economic and societal implications of each.					
Compare and contrast regulations in the United States with those in countries from which the U.S. imports agricultural products.					
Compare and contrast types of business ownership models.					
Write a business plan for an agricultural entrepreneurial enterprise.					
Define and analyze the relationships among basic business concepts used in agribusiness.					

Question 1_4

Many states offer agribusiness courses as part of their agricultural education career pathway. Other states integrate agribusiness concepts and principles in other agricultural education courses. Reflect on your ability to teach the following competencies using the following scale: **No Confidence** in teaching the competency, **Little Confidence** in the teaching the competency, **Somewhat Confident** in teaching the competency, **Confident** in teaching the competency, and **Very Confident** in teaching the competency.

Competency	Select one level of confidence for each competency.				
	No Confidence (1)	Little Confidence (2)	Somewhat Confident (3)	Confident (4)	Very Confident (5)
Explain how components of financial recordkeeping affect operations and management decisions for an agricultural enterprise.					
Compare the costs affecting the production of agricultural products with the costs of producing and marketing non-agricultural products.					
Explain the economic impact of agriculture futures and commodities on the local, state, national and the global economy.					
Compare and contrast the sale of agricultural products through local marketing to the sale of products in futures markets.					
Describe basic marketing principles fundamental to the sale of agriculture products.					
Research an agricultural product or service to determine its features and consumer benefits.					
Develop and present an agricultural marketing or sales plan.					
Explore the evolution of agribusiness in the United States by describing the modern agribusiness sectors.					
Compare and contrast different business and ownership models of agribusinesses.					
Demonstrate the ability to prepare basic personal and business records.					
Examine different forms of saving, investing, and financing by researching available financial services at banks, credit unions, and savings and loans.					
Apply principles of consumer finance, savings, investing, and loans to develop personal and agribusiness budgets.					
Articulate the components of a business plan.					
Differentiate between bookkeeping and accounting.					

Question 1_5

Many states offer agribusiness courses as part of their agricultural education career pathway. Other states integrate agribusiness concepts and principles in other agricultural education courses. Reflect on your ability to teach the following competencies using the following scale: **No Confidence** in teaching the competency, **Little Confidence** in the teaching the competency, **Somewhat Confident** in teaching the competency, **Confident** in teaching the competency, and **Very Confident** in teaching the competency.

Competency	Select one level of confidence for each competency.				
	No Confidence (1)	Little Confidence (2)	Somewhat Confident (3)	Confident (4)	Very Confident (5)
Apply fundamental principles of financial recordkeeping to agribusiness planning, logistics, and operations.					
Research and generate connections regarding the relationships between depreciation, taxation, and insurance.					
Develop claim(s) and counterclaim(s) about the importance of a specific responsible personal finance practice in agribusiness.					
Examine essential principles of consumer finance by summarizing common banking procedures and services.					
Explain how economic principles apply to agribusiness.					
Analyze the role of government in setting monetary, fiscal, and taxation policies that affect the operations of agriculture businesses.					
Assess the global impact of American commodities on world food markets.					
Assess the importance of entrepreneurship in society.					
Develop a comprehensive business plan for an agriculture-related business.					
Determine the role that effective managerial skills play in an agribusiness venture.					
Summarize the history of agriculture-related policy development at the state and national levels.					

Question 2

For any type of business or economics based course(s) that you completed during college (undergraduate or graduate), place a check in the box next to the course. Please consider general, agricultural, natural resource, or any special business or economics based course(s). Select all that apply.

- Introduction to Agribusiness (Agricultural Economics)
- Microeconomics
- Macroeconomics
- Marketing
- Agribusiness (Business) Law
- Agribusiness (Business) Management
- Farm Management
- Entrepreneurship
- Accounting
- Finance
- Personal Finance
- Other (Please specify) _____

Question 3

How many total agribusiness, agricultural economics, business, or economics related courses did you complete at the collegiate level (undergraduate and graduate)?

Question 4

What is your highest level of education completed?

- High School
- Associate degree
- Bachelor's Degree
- Master's Degree
- Educational Specialists Degree
- Doctoral Degree

Question 5

Which of the following best describes your undergraduate major?

- Agricultural Education
- Agricultural Economics / Agribusiness
- Agricultural Engineering
- Animal Science
- Plant Science with emphasis in Horticulture
- Plant Science with emphasis Agronomy
- Natural Resource / Forestry / Wildlife Management
- Other Agricultural Related Major (Please Specify Major) _____
- Business / Economics (Non-Agricultural)
- Education (Non-Agricultural)
- Other (Please Specify Major) _____
- No Undergraduate Degree

Question 6

Which of the following best describes your graduate major?

- Agricultural Education
- Agricultural Economics / Agribusiness
- Agricultural Engineering
- Animal Science
- Plant Science with emphasis in Horticulture
- Plant Science with emphasis Agronomy
- Natural Resource / Forestry / Wildlife Management
- Other Agricultural Related Major (Please Specify Major) _____
- Business / Economics (Non-Agricultural)
- Education (Non-Agricultural) with emphasis in Instruction / Curriculum / Teacher
- Education (Non-Agricultural) with emphasis in Administration / Leadership
- Other (Please Specify Major) _____
- No Graduate Degree

Question 7

Select the range that best describes your undergraduate Grade Point Average (GPA).

_____ 3.5 - 4.0

_____ 3.0 - 3.49

_____ 2.5 - 2.99

_____ Below 2.5

Question 8

Which of the following best describes your teaching certification?

_____ Traditional

_____ Alternative Route

Question 9

Which types of agricultural education courses have you taught at least once during your career? (Select all that apply.)

_____ General Agriculture

_____ Agriscience

_____ Agribusiness

_____ Animal Science / Small Animal / Poultry / Livestock Management

_____ Veterinary Science

_____ Agronomy / Plant Science

_____ Horticultural Science / Greenhouse / Nursery / Floriculture

_____ Agricultural Engineering / Mechanics

_____ Natural Resource Management / Forestry / Wildlife

_____ Food Science

_____ Agricultural Leadership / Communications

_____ Other Agricultural Course (Please Specify) _____

Question 10

What resources do you have available in your program to teach agribusiness topics, lessons, or courses?

- Agribusiness textbook available to use as a resource
- Commercially developed agribusiness curriculum available to use as a resource
- Computer in the classroom that students can access
- Access to a computer lab (mobile or traditional) at your school
- Community agribusiness/business leaders available to serve as guest speakers
- University Extension (agents, specialists, documents, publications, field days, etc.)
- Community agribusiness/business leaders serving on a local advisory council
- Other resources (please specify) _____
- No resources available to teach agribusiness

Question 11

What business related professional experiences have you participated in during your life? (Select all that apply.)

- Interned with a company
- Employed in a finance related position by a company/organization
- Employed in a sales related position by a company/organization
- Employed in a merchandizing related position by a company/organization
- Employed in a marketing related position by a company/organization
- Employed in a management related position by a company/organization
- Owned and operated a personal business (entrepreneurship)
- Owned and operated a farm
- Other business related professional experience (Please Specify) _____
- None of the above apply

Question 12

What types of professional development have you completed to enhance your ability to teach agribusiness topics, lessons, or course?

- _____ Professional development sponsored or provided by State Department of Education
- _____ Professional development sponsored or provided by United States Department of Education
- _____ Professional development sponsored or provided by state agriculture teachers association
- _____ Professional development sponsored or provided by national agriculture teachers association
- _____ Professional development sponsored or provided by other professional (non-agriculture education teachers) association
- _____ Professional development sponsored or provided by private industry
- _____ Professional development sponsored or provided by land-grant university
- _____ Professional development sponsored or provided by non land-grant university
- _____ Professional development sponsored or provided by State Department of Agriculture
- _____ Professional development sponsored or provided by United States Department of Agriculture
- _____ Other (Please Specify) _____
- _____ Have not attended agribusiness related professional development

Question 13

How many years have you taught secondary agricultural education? _____

Question 14

What is your current age? _____

APPENDIX C

DESCRIPTIVE STATISTICS OF MISSISSIPPI AND TENNESSEE SECONDARY AGRIBUSINESS COURSE COMPETENCIES SORTED BY FACTOR

Competency	Mean	SD	Median	Mode	Min	Max	Range
Management and Entrepreneurship							
Describe and apply the decision-making process.	3.51	0.961	4	4	1	5	4
Evaluate a business plan for an agricultural enterprise.	3.05	0.957	3	3	1	5	4
Develop a concept for an agribusiness.	3.25	0.995	3	3	1	5	4
Explain agribusiness retailing.	3.14	1.031	3	3	1	5	4
Explain the sales process.	3.37	1.006	3	3	1	5	4
Identify various types of advertising involved in agriculture.	3.35	1.023	3	3	1	5	4
Discuss the function of agribusiness management and its impact on risk and cultural environments.	2.94	1.029	3	3	1	5	4
Apply basic principles of economics to the management and administration of a selected business.	3.00	1.036	3	3	1	5	4
Manage a school-based business venture.	3.54	0.998	4	3	1	5	4
Apply principles of business ethics.	3.54	1.043	4	4	1	5	4
Explore human resources management.	3.38	0.972	3	4	1	5	4
Explore and compare local, regional, state, national, and global career opportunities in the agribusiness industry.	3.27	1.044	3	4 & 5	1	5	4
Examine specific business practices, laws, regulations, and technologies that have evolved within the agribusiness sector, and evaluate the economic and societal implications of each.	2.83	1.052	3	3	1	5	4
Compare and contrast types of business ownership models.	3.17	1.026	3	4	1	5	4
Write a business plan for an agricultural entrepreneurial enterprise.	2.88	1.051	3	3	1	5	4
Define and analyze the relationships among basic business concepts used in agribusiness.	2.94	1.012	3	3	1	5	4
Explain how components of financial recordkeeping affect operations and management decisions for an agricultural enterprise.	3.03	1.057	3	3	1	5	4
Compare the costs affecting the production of agricultural products with the costs of producing and marketing non-agricultural products.	2.96	1.035	3	3	1	5	4
Explain the economic impact of agriculture futures and commodities on the local, state, national and the global economy.	2.84	0.996	3	3	1	5	4

Competency	Mean	SD	Median	Mode	Min	Max	Range
Management and Entrepreneurship							
Continued							
Describe basic marketing principles fundamental to the sale of agriculture products.	3.15	0.936	3	3	1	5	4
Research an agricultural product or service to determine its features and consumer benefits.	3.33	1.056	3	3	1	5	4
Explore the evolution of agribusiness in the United States by describing the modern agribusiness sectors.	2.94	1.073	3	3	1	5	4
Compare and contrast different business and ownership models of agribusinesses.	3.14	1.074	3	3	1	5	4
Demonstrate the ability to prepare basic personal and business records.	3.38	1.000	3	3	1	5	4
Examine different forms of saving, investing, and financing by researching available financial services at banks, credit unions, and savings and loans.	3.12	0.970	3	3	1	5	4
Articulate the components of a business plan.	3.02	1.044	3	3	1	5	4
Explain how economic principles apply to agribusiness.	3.02	1.095	3	3	1	5	4
Determine the role that effective managerial skills play in an agribusiness venture.	3.07	1.033	3	3	1	5	4
Budgeting							
Describe basic record-keeping principles.	3.86	0.893	4	4	1	5	4
Maintain income and expense records.	3.81	0.910	4	4	1	5	4
Apply basic inventory principles.	3.88	0.922	4	4	1	5	4
Examine a balance sheet (i.e., net worth statement).	3.42	0.996	4	4	1	5	4
Examine an income statement.	3.60	0.966	4	4	1	5	4
Examine a cash flow statement.	3.53	0.971	4	4	1	5	4
Examine the importance of personal budgeting.	3.92	0.896	4	4	1	5	4
Prepare an enterprise budget, a partial budget, and a cash flow budget related to selected agribusiness scenarios.	3.08	1.037	3	3	1	5	4
Project annual income based on different hourly wages.	3.65	1.084	4	4	1	5	4
Understand budgeting and recordkeeping procedures in an agribusiness.	3.43	0.958	3	4	1	5	4
Prepare a budget for a given enterprise.	3.30	0.959	3	3	1	5	4

Competency	Mean	SD	Median	Mode	Min	Max	Range
Legal Regulations							
Manage personal income taxes.	3.30	0.900	3	3	1	5	4
Manage business taxes.	2.72	0.885	3	3	1	5	4
Describe common legal issues and documents and their applications.	2.74	0.928	3	3	1	5	4
Describe legal requirements for a business.	2.69	0.989	3	3	1	5	4
Describe safety and health regulations related to agribusinesses.	3.30	1.117	3	3	1	5	4
Distinguish among basic economic principles in agribusiness.	3.21	0.992	3	4	1	5	4
Finance							
Explore the concept and principles of entrepreneurship.	3.56	0.849	4	4	2	5	3
Describe the characteristics and functions of various financial institutions.	3.27	0.953	3	4	1	5	4
Explore banking services for personal and business accounts.	3.45	0.997	4	4	1	5	4
Explore concepts of credit.	3.47	0.932	4	4	1	5	4
Compare loan options.	3.28	0.983	3	3	1	5	4
Investigate the concepts of risk and insurance.	3.07	1.051	3	3	1	5	4
Compare types of accounting and bookkeeping systems used in agribusiness.	3.08	0.974	3	3	1	5	4
Establish inventory values.	3.32	1.027	3	4	1	5	4
Understand the various types of investment opportunities.	3.05	0.971	3	3	1	5	4
Explain an agribusiness enterprise.	3.36	0.970	3	4	1	5	4
Apply economic principles as they relate to business management.	3.05	0.980	3	3	1	5	4
Agribusiness Marketing							
Understand the principles of business management.	3.40	0.937	3	3	1	5	4
Plan and manage career-development options in agribusiness.	3.29	0.928	3	3	1	5	4
Assess financial standing in an agribusiness using financial records.	3.14	0.962	3	4	1	5	4
Utilize the concepts of sales and marketing to plan and execute a marketing and public relations plan that promotes agricultural products and services that meet the needs of customers.	3.15	1.089	3	3	1	5	4
Compare and contrast the sale of agricultural products through local marketing to the sale of products in futures markets.	2.98	1.009	3	3	1	5	4

Competency	Mean	SD	Median	Mode	Min	Max	Range
Risk Management							
Assess financial risk factors in agribusiness management.	2.93	0.960	3	3	1	5	4
Discuss risks associated with capital resources in agribusiness.	2.85	0.965	3	3	1	5	4
Evaluate production risks associated with agribusiness management.	2.93	0.997	3	3	1	5	4
Identify the types, methods, and resources for insuring various types of agribusinesses.	2.78	1.004	3	3	1	5	4
Describe principles related to the acquisition and use of capital.	2.88	1.051	3	2 & 3	1	5	4
Explore international marketing opportunities.	2.69	1.068	3	3	1	5	4
Business Planning							
Differentiate between macroeconomics and microeconomics in agribusiness.	3.02	1.018	3	3	1	5	4
Construct specific, measurable, attainable, realistic, and timely (SMART) goals for the agribusiness.	3.59	0.967	4	3	1	5	4
Prepare a business plan for the agribusiness.	3.24	0.943	3	3	1	5	4
Develop a basic marketing plan for a local business.	3.19	1.005	3	3	1	5	4
Develop and present an agricultural marketing or sales plan.	3.14	1.094	3	3	1	5	4
Develop a comprehensive business plan for an agriculture-related business.	2.93	1.076	3	3	1	5	4
Agribusiness Importance							
Understand the scope and importance of agribusiness.	3.90	0.884	4	4	2	5	3
Explain agribusiness marketing.	3.31	1.060	3	3	1	5	4
Describe the types of markets used to sell agricultural products.	3.32	1.001	3	4	1	5	4
Describe various types of agribusinesses.	3.59	1.022	4	4	1	5	4
Assess the importance of entrepreneurship in society.	3.17	1.061	3	3	1	5	4

Competency	Mean	SD	Median	Mode	Min	Max	Range
Macroeconomics							
Compare and contrast regulations in the United States with those in countries from which the U.S. imports agricultural products.	2.76	1.020	3	3	1	5	4
Apply principles of consumer finance, savings, investing, and loans to develop personal and agribusiness budgets.	2.94	0.993	3	3	1	5	4
Differentiate between bookkeeping and accounting.	3.12	1.068	3	3	1	5	4
Apply fundamental principles of financial recordkeeping to agribusiness planning, logistics, and operations.	3.06	1.029	3	3	1	5	4
Research and generate connections regarding the relationships between depreciation, taxation, and insurance.	2.83	1.103	3	3	1	5	4
Develop claim(s) and counterclaim(s) about the importance of a specific responsible personal finance practice in agribusiness.	2.68	1.070	3	3	1	5	4
Examine essential principles of consumer finance by summarizing common banking procedures and services.	2.82	1.037	3	3	1	5	4
Analyze the role of government in setting monetary, fiscal, and taxation policies that affect the operations of agriculture businesses.	2.67	1.073	3	2 & 3	1	5	4
Assess the global impact of American commodities on world food markets.	2.85	1.055	3	2	1	5	4
Summarize the history of agriculture-related policy development at the state and national levels.	2.84	1.040	3	3	1	5	4

APPENDIX D

PRINCIPAL COMPONENT ANALYSIS STRUCTURAL MATRIX

Standards	Factor	1	2	3	4	5	6	7	8	9
Explore the concept and principles of entrepreneurship.	4	0.51	0.56	0.48	0.69	0.43		0.41	0.49	
Understand the scope and importance of agribusiness.	8	0.53	0.50	0.50	0.62	0.44		0.35	0.70	
Describe the characteristics and functions of various financial institutions.	4	0.53	0.44	0.45	0.87	0.45	0.32	0.39	0.45	0.41
Explore banking services for personal and business accounts.	4	0.50	0.46	0.41	0.85	0.36	0.35	0.51	0.39	0.39
Explore concepts of credit.	4	0.55	0.59	0.42	0.87	0.40		0.41	0.44	0.43
Compare loan options.	4	0.56	0.47	0.35	0.89	0.36	0.36	0.50	0.37	0.44
Investigate the concepts of risk and insurance.	4	0.57	0.42	0.48	0.85	0.31	0.52	0.46	0.40	0.46
Describe basic record-keeping principles.	2	0.38	0.73	0.40	0.57	0.31		0.56	0.55	0.32
Compare types of accounting and bookkeeping systems used in agribusiness.	4	0.47	0.50	0.50	0.65	0.60	0.43	0.39	0.50	0.54
Maintain income and expense records.	2	0.35	0.82		0.56	0.31		0.44	0.45	
Apply basic inventory principles.	2	0.51	0.74	0.41	0.62	0.35	0.32	0.41	0.57	0.34
Establish inventory values.	4	0.51	0.64	0.55	0.65	0.38	0.46	0.31	0.47	0.44
Understand the various types of investment opportunities.	4	0.47	0.55	0.65	0.66	0.46	0.51		0.49	0.54
Examine a balance sheet (i.e., net worth statement).	2	0.42	0.85	0.55	0.55	0.37	0.37	0.31	0.42	0.36
Examine an income statement.	2	0.42	0.91	0.51	0.47	0.32	0.34	0.33	0.42	0.39
Examine a cash flow statement.	2	0.39	0.90	0.52	0.44	0.32	0.35	0.33	0.37	0.35
Examine the importance of personal budgeting.	2	0.39	0.80	0.41	0.52			0.47	0.58	
Prepare an enterprise budget, a partial budget, and a cash flow budget related to selected agribusiness scenarios.	2	0.54	0.74	0.52	0.57	0.61	0.42	0.33	0.43	0.49
Project annual income based on different hourly wages.	2		0.71	0.43	0.38			0.38	0.68	
Explain agribusiness marketing.	8	0.56	0.60	0.43	0.57	0.60	0.46	0.58	0.66	0.38
Describe the types of markets used to sell agricultural products.	8	0.57	0.60	0.58	0.60	0.50	0.44	0.56	0.75	0.47
Describe various types of agribusinesses.	8	0.58	0.64	0.53	0.56	0.42	0.30	0.54	0.78	0.39

Standards	Factor	1	2	3	4	5	6	7	8	9
Understand the principles of business management.	5	0.65	0.48	0.60	0.63	0.68	0.47	0.57	0.55	0.42
Plan and manage career-development options in agribusiness.	5	0.58	0.47	0.48	0.60	0.71	0.41	0.55	0.51	0.46
Understand budgeting and recordkeeping procedures in an agribusiness.	2	0.66	0.70	0.60	0.68	0.63	0.35	0.50	0.49	0.41
Assess financial standing in an agribusiness using financial records.	5	0.61	0.66	0.57	0.65	0.68	0.43	0.49	0.46	0.54
Manage personal income taxes.	3	0.32	0.42	0.81	0.34				0.32	0.34
Manage business taxes.	3	0.40	0.39	0.87	0.34	0.40	0.37		0.32	0.34
Describe common legal issues and documents and their applications.	3	0.62	0.35	0.68	0.59	0.55	0.60	0.33	0.36	0.41
Describe legal requirements for a business.	3	0.61	0.36	0.74	0.50	0.53	0.60	0.45	0.35	0.52
Describe safety and health regulations related to agribusinesses.	3	0.61	0.56	0.67	0.50	0.41	0.57	0.40	0.64	0.45
Distinguish among basic economic principles in agribusiness.	3	0.64	0.51	0.70	0.57	0.57	0.51	0.57	0.57	0.46
Explain an agribusiness enterprise.	4	0.59	0.52	0.61	0.62	0.49	0.46	0.55	0.53	0.41
Apply economic principles as they relate to business management.	4	0.56	0.49	0.66	0.67	0.63	0.63	0.50	0.42	0.52
Differentiate between macroeconomics and microeconomics in agribusiness.	7	0.51	0.46	0.52	0.49	0.47	0.61	0.63	0.40	0.42
Assess financial risk factors in agribusiness management.	6	0.65	0.60	0.59	0.64	0.54	0.71	0.52	0.52	0.54
Discuss risks associated with capital resources in agribusiness.	6	0.61	0.57	0.60	0.61	0.38	0.73	0.43	0.46	0.49
Evaluate production risks associated with agribusiness management.	6	0.65	0.58	0.62	0.60	0.50	0.71	0.51	0.47	0.54
Identify the types, methods, and resources for insuring various types of agribusinesses.	6	0.59	0.50	0.54	0.54	0.44	0.70	0.49	0.38	0.62
Describe and apply the decision-making process.	1	0.64	0.55	0.57	0.63		0.38	0.52	0.39	0.48
Describe principles related to the acquisition and use of capital.	6	0.66	0.48	0.60	0.62	0.36	0.70	0.50	0.36	0.54

Standards	Factor	1	2	3	4	5	6	7	8	9
Prepare a budget for a given enterprise.	2	0.58	0.70	0.61	0.53	0.42	0.44	0.62	0.42	0.38
Evaluate a business plan for an agricultural enterprise.	1	0.69	0.58	0.53	0.64	0.54	0.51	0.67	0.39	0.39
Develop a concept for an agribusiness.	1	0.69	0.53	0.46	0.62	0.46	0.48	0.65	0.52	0.36
Construct specific, measurable, attainable, realistic, and timely (SMART) goals for the agribusiness.	7	0.44			0.44			0.84	0.36	0.34
Prepare a business plan for the agribusiness.	7	0.64	0.54	0.44	0.57	0.66	0.46	0.71	0.48	0.49
Develop a basic marketing plan for a local business.	7	0.58	0.44	0.40	0.52	0.64	0.38	0.79	0.53	0.39
Explore international marketing opportunities.	6	0.55	0.41	0.34	0.44	0.53	0.67	0.58	0.50	0.64
Explain agribusiness retailing.	1	0.71	0.52	0.55	0.57	0.53	0.54	0.66	0.51	0.61
Explain the sales process.	1	0.67	0.50	0.55	0.57	0.54	0.36	0.59	0.64	0.60
Identify various types of advertising involved in agriculture.	1	0.66	0.35	0.43	0.40	0.54	0.37	0.61	0.64	0.49
Utilize the concepts of sales and marketing to plan and execute a marketing and public relations plan that promotes agricultural products and services that meet the needs of customers.	5	0.66	0.35	0.42	0.56	0.68	0.41	0.60	0.63	0.49
Discuss the function of agribusiness management and its impact on risk and cultural environments.	1	0.70	0.36	0.40	0.56	0.62	0.61	0.50	0.62	0.59
Apply basic principles of economics to the management and administration of a selected business.	1	0.76	0.44	0.55	0.58	0.69	0.59	0.52	0.57	0.60
Manage a school-based business venture.	1	0.70	0.46	0.54	0.61	0.52	0.31	0.61	0.54	0.52
Apply principles of business ethics.	1	0.82	0.48	0.52	0.58	0.43	0.37	0.52	0.53	0.42
Explore human resources management.	1	0.80	0.52	0.51	0.61	0.41	0.47	0.52	0.50	0.53
Explore and compare local, regional, state, national, and global career opportunities in the agribusiness industry.	1	0.88	0.39	0.42	0.57	0.44	0.49	0.51	0.49	0.52

Standards	Factor	1	2	3	4	5	6	7	8	9
Examine specific business practices, laws, regulations, and technologies that have evolved within the agribusiness sector, and evaluate the economic and societal implications of each.	1	0.79	0.38	0.54	0.50	0.59	0.58	0.37	0.40	0.61
Compare and contrast regulations in the United States with those in countries from which the U.S. imports agricultural products.	9	0.72	0.34	0.50	0.45	0.55	0.54	0.52	0.35	0.76
Compare and contrast types of business ownership models.	1	0.81	0.37	0.58	0.56	0.46	0.44	0.54	0.38	0.58
Write a business plan for an agricultural entrepreneurial enterprise.	1	0.73	0.44	0.54	0.48	0.70	0.52	0.57	0.48	0.55
Define and analyze the relationships among basic business concepts used in agribusiness.	1	0.84	0.42	0.48	0.61	0.55	0.49	0.56	0.46	0.69
Explain how components of financial recordkeeping affect operations and management decisions for an agricultural enterprise.	1	0.80	0.46	0.45	0.61	0.62	0.52	0.46	0.44	0.61
Compare the costs affecting the production of agricultural products with the costs of producing and marketing non-agricultural products.	1	0.84	0.42	0.47	0.56	0.59	0.57	0.52	0.46	0.63
Explain the economic impact of agriculture futures and commodities on the local, state, national and the global economy.	1	0.73	0.43	0.43	0.56	0.68	0.49	0.38	0.48	0.69
Compare and contrast the sale of agricultural products through local marketing to the sale of products in futures markets.	5	0.60	0.44	0.50	0.47	0.68	0.39	0.36		0.66
Describe basic marketing principles fundamental to the sale of agriculture products.	1	0.77	0.43	0.57	0.59	0.66	0.30	0.53	0.50	0.52
Research an agricultural product or service to determine its features and consumer benefits.	1	0.78	0.46	0.61	0.59	0.53	0.31	0.68	0.53	0.47

Standards	Factor	1	2	3	4	5	6	7	8	9
Develop and present an agricultural marketing or sales plan.	7	0.64	0.45	0.48	0.58	0.59	0.46	0.75	0.55	0.55
Explore the evolution of agribusiness in the United States by describing the modern agribusiness sectors.	1	0.74	0.40	0.52	0.62	0.56	0.46	0.49	0.47	0.65
Compare and contrast different business and ownership models of agribusinesses.	1	0.83	0.46	0.58	0.63	0.55	0.49	0.54	0.49	0.62
Demonstrate the ability to prepare basic personal and business records.	1	0.71	0.62	0.60	0.61	0.49		0.58	0.44	0.56
Examine different forms of saving, investing, and financing by researching available financial services at banks, credit unions, and savings and loans.	1	0.67	0.51	0.64	0.67	0.43		0.49	0.43	0.67
Apply principles of consumer finance, savings, investing, and loans to develop personal and agribusiness budgets.	9	0.63	0.41	0.50	0.65	0.50		0.50		0.72
Articulate the components of a business plan.	1	0.70	0.47	0.58	0.58	0.55	0.43	0.68	0.51	0.67
Differentiate between bookkeeping and accounting.	9	0.62	0.49	0.58	0.51	0.52	0.46	0.56	0.49	0.71
Apply fundamental principles of financial recordkeeping to agribusiness planning, logistics, and operations.	9	0.68	0.46	0.59	0.58	0.56	0.54	0.51	0.47	0.70
Research and generate connections regarding the relationships between depreciation, taxation, and insurance.	9	0.61	0.44	0.58	0.58	0.48	0.55	0.42	0.43	0.71
Develop claim(s) and counterclaim(s) about the importance of a specific responsible personal finance practice in agribusiness.	9	0.67	0.43	0.55	0.61	0.46	0.60	0.48	0.38	0.71
Examine essential principles of consumer finance by summarizing common banking procedures and services.	9	0.64	0.45	0.61	0.65	0.43	0.47	0.53	0.45	0.79
Explain how economic principles apply to agribusiness.	1	0.68	0.43	0.62	0.66	0.43	0.54	0.54	0.56	0.65

Standards	Factor	1	2	3	4	5	6	7	8	9
Analyze the role of government in setting monetary, fiscal, and taxation policies that affect the operations of agriculture businesses.	9	0.61	0.39	0.51	0.55	0.38	0.55	0.35	0.49	0.82
Assess the global impact of American commodities on world food markets.	9	0.64	0.38	0.49	0.51	0.40	0.58	0.48	0.59	0.73
Assess the importance of entrepreneurship in society.	8	0.70	0.44	0.54	0.56	0.38	0.49	0.54	0.75	0.62
Develop a comprehensive business plan for an agriculture-related business.	7	0.61	0.48	0.52	0.57	0.51	0.55	0.65	0.61	0.65
Determine the role that effective managerial skills play in an agribusiness venture.	1	0.72	0.49	0.51	0.64	0.48	0.42	0.64	0.56	0.65
Summarize the history of agriculture-related policy development at the state and national levels.	9	0.60	0.43	0.49	0.54	0.42	0.45	0.48	0.44	0.86

APPENDIX E
RESPONSES TO “OTHER” OPTION

Variable	Item	Participant Responses
Collegiate Course Type	Other Business Related Course	<ul style="list-style-type: none"> • Training by 4th Farm Credit district loan officer training, Louisville, KY Farm Credit Services • School Finance • Policy and Cooperatives • Intro to Business • Human resource management • Agricultural Economics • AgBusiness Finance • Ag Education • Ag Economics/General Business
College Major	Other Agriculturally Related Undergraduate Major	<ul style="list-style-type: none"> • Landscape Architecture • Biology • Agricultural Information Science • Ag Ed/ Extension Ed • Ag Business/Ag Ed
College Major	Other Non-Agriculturally Related Undergraduate Major	<ul style="list-style-type: none"> • Political Science • Communications
College Major	Other Agriculturally Related Graduate Major	<ul style="list-style-type: none"> • AG Administration and Leadership • Ag & Extension Education - Leadership
Subject Matter	Other Agricultural Education Subject Taught	<ul style="list-style-type: none"> • WBL/Career Practicum • Teaching Agribusiness for the 1st time next semester (spring 2019) • Supervised Agriculture Experience • Personal Finance • Landscaping • Forestry • Environmental Science • All Ag Mechanics pathways • Ag and Natural Resources • Ag and Natural resources • AEST Courses

Resource	Other Resources Available to Teach Agribusiness	<ul style="list-style-type: none"> • FFA Marketing Plan CDE Contest
Business Experience	Other Business Related Occupational Experiences	<ul style="list-style-type: none"> • Lobbying for NAAE • Bank
Professional Development	Other Agribusiness or Business Related Professional Development	<ul style="list-style-type: none"> • School District • Personal Finance Training • Forming working relationships with local Agribusiness individuals • Federal Reserve Bank • Ag in Classroom Farm Bureau