Teacher Perception of the Three-Component Model of Agriculture Education by Georgia's Agriculture Education Teachers

By

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Abstract

The purpose of this study was to describe teacher perceptions of the three-component model of agriculture education. The participants in this study were agriculture education teachers in Georgia. This study used a quantitative non-experimental survey design. The data was analyzed and reported utilized a variety of statistical procedures including frequencies, percentages, means, standard deviations, mean weighted discrepancy scores, pairwise comparisons, and a Kruskal-Wallace test. The study investigated where Georgia's agriculture education teachers were spending their time. The responses were evaluated against the assumption that the three-components represent equal time spent in each component. These responses and the data from the study can be used to align professional learning opportunities, to support teachers along their career, and to help design teacher education programs.

The data illustrates a difference in where the teacher would like to spend their time, and where they are currently spending their time. Tasks associated with one component were rated on how important they are, and the teacher's level of competence in that task. These scores provided a list of tasks ranked by MWDS that can be evaluated from highest score to lowest score. Finally, recommendations were made using the data to guide professional practice and development.

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Introduction

Agriculture is a diverse topic. The practices and outputs are different in many regions in the United States. Agriculture knowledge learned through generations in the United States would be much less useful if the agriculturalist moved to Africa or Europe. Agricultural practitioners even differ in their approaches to management and ecology. Agriculture specialization is important because of the vast necessity of the industry. The challenge of feeding a growing population with less useful land is the challenge that agriculture will have to solve in the future. No industry can be more directly related to the health, safety, and security of the world's population. Agriculture is one of our nation's most important industries ("Ag snapshots", 2021). Agriculturalists are on the front lines in the battles of hunger, ecology, and many other issues that citizens feel as the upmost important topic of the day, yet many people do not understand how important agriculture is to their lives (Brune, Stevenson, Knollenburg, & Barbieri, 2020). Many people are generations removed from the farm, and they cannot understand the important role of agriculture (Leising & Zilbert, 1994). This is an illustration of how efficient and effective the agricultural industry has become. Through innovations in equipment and technology, food producers are hundreds of times more productive than the farmers of the past. This success allows a large portion of the population to naively believe that they do not need to worry about agriculture or its practices (Richardson, 1999). In agriculture, many of the problems that will need to be solved are challenging. America needs the best and brightest young people to work in the agriculture industry in the future. America's educational decision makers have recently voiced the importance of STEM (science, technology, engineering and math). Education worries that America will not have enough interested students in these disciplines in the future. No industry focuses on innovation through these disciplines more than

agriculture. With less than one percent of Americans responsible for food production, farmers and ranchers need to remain efficient to meet the demand of a growing population. In turn, all members of society need to have a basic understanding of agriculture to make informed decisions in their daily lives (Powell, Agnew, & Trexler, 2008). Agriculture literacy is an obstacle for society to overcome if we want to optimize agriculture's effectiveness.

Agriculture education classes are many students first introduction to the production of food, fiber, and shelter for human consumption. Students learn about soil conservation, responsible irrigation, and animal husbandry when these lessons were compulsory generations ago. As people become more disassociated with the family farm, agriculture education becomes more, not less, important. Individuals need this understanding to become educated consumers, ecologically responsible members of society, and stewards of their own health. All students and schools can benefit from an agriculture education program. Agriculture education has many other benefits to the student. The corresponding Career and Technical Student Organization (CTSO) to agriculture education is the FFA. The National FFA Organization is dedicated to making a positive difference in the lives of students by developing their potential for premier leadership, personal growth, and career success through agricultural education. The FFA becomes many students place to belong is school. This sense of belonging is a powerful tool in the students reaching their full potential in their educational careers (Rose, Stephens, Stripling, Cross, Sanok, & Brawner, 2016). The FFA develops student's leadership through lessons, assessments, and opportunities than many students never get to experience. The FFA allows students to achieve at the school, local, state, and national level. Young students have trained models in older students, and they can serve the FFA as leaders as they progress in their abilities. Students have the opportunity to apply what they have learned in real world applications. Many

times, this is through the student's Supervised Agricultural Experience (SAE). This project based learning exercise is planned by the student, supervised by an adult, and it is an opportunity for the student to learn important lessons in record keeping and time management as the SAE takes place during non-school hours. Many students take this opportunity to learn woodworking skills, experiment into agriscience, or own and raise a livestock animal. This type of experiential learning teaches student problem solving skills that will benefit them no matter their future vocation (Baker, Robinson, Kolb, 2012).

The integration of classroom instruction, FFA, and SAE makes the three-component model of agriculture education. This type of teaching has become the hallmark of agriculture education through the ages, but it is still highly relevant today. Students learn agricultural literacy through classroom and laboratory instruction. Students learn new knowledge and skills in class, watch as the skill is demonstrated by a teacher, and then practice the skill through guided laboratory activities. Examples of these type of successes could be a student learning to weld in an agricultural mechanics class, a student asexually propagating plants in the greenhouse, or a student designing a feed program for their show barrow. This curriculum will also serve the school. These lessons support the core content being taught in the classes. A student may not understand genetics in biology through rote memorization, but they will build understanding when using genotype and phenotype assigning breeding pairs in animal science. Students who have learned about pH in science will have an opportunity to apply that knowledge through a plant science class. When students learn to apply these skills, they can take these skills into real world applications (Baker et.al., 2012). These new skills can be applied when students complete their SAE project. Students can find employment with these skills, start a business, or profit from a livestock project. Students are required to track expenses, time allotted, and profits

of the project, and the information is graded as part of the mandatory record keeping aspect of the SAE. Students will not only learn work skills, but the FFA can also build their leadership skills while they are enrolled in agriculture education class (McElravy & Hastings, 2014). Students will at least learn aspects of verbal communication while reciting the FFA Creed in class, but many students take advantage of the many opportunities the FFA allows for students to compete. Students can take their public speaking skills to the National level through Career Development Events (CDEs) or Leadership Development Events (LDEs). These competitions allow FFA members to test their skills against other members nationally.

One organization that understands that agriculture needs the best and brightest students for the future of agriculture is the American Association for Agriculture Education (AAAE). The AAAE plans a five-year Research Agenda to guide agricultural research to fit the needs of the global agriculture industry. In their Research Agenda, they record needs exist in having meaningful, engaged learning in all environments, and there is a need for efficient and effective agricultural education programs. Learning in all environments would reach a more diverse group of learners. Agriculture education is not only classroom teaching and learning. To promote agriculture literacy to the masses, educational opportunities must occur where it is needed. Too many uninformed people hold agriculture responsible for many of the world's problems. To reach this demographic, agriculture education would need to reach them where they are, not in an agriculture class. If the message or lesson is valid, the people will become engaged. When instruction is meaningful, and students are engaged, there is an opportunity for agriculture education to promote the agriculture industry. The second priority about efficient and effective agricultural education programs is a more specialized goal. This priority speaks for the need for agricultural education evolve with the changing agricultural industry. Agriculture education

needs to train students for the current, and future, state of the agriculture industry. New problems in agriculture will take a technical or engineering solution. Agricultural education needs to incorporate these lessons into the curriculum to produce students who are ready to help the agricultural industry stay on the cutting edge of new technologies and be constantly innovative with solutions.

To have meaningful, engaged learning to a market of students with no previous knowledge of education, there must be effective teaching. To have efficient and effective agriculture programs, an effective agriculture education teacher needs to be designing the curriculum, advising students, and supervising learning. Especially in School Based Agriculture Education (SBAE), the teacher's effectiveness is the driving factor in teaching students, promoting agriculture, and recruiting the next generation of students to the program. The America Association for Agricultural Education (AAAE). Research Agenda promotes teacher education programs to produce teachers that lead, plan, and organize these agriculture education programs to fit the needs of their students, schools, and communities. Using the three-component model, teachers can design classroom curriculum to fit the needs of the students without forgetting the needs of the current, and future, agriculture industry. Engaged students will be drawn to the FFA where they can learn skills, and apply them, at very high levels (Rose et.al., 2016). Many of these skills are essential skills like communication that can be used in any vocation the student uses to pursue. An effective teacher can supervise experiential learning opportunities so that students can learn to work at an industry standard, so the student can make an immediate impact on the agricultural industry when they join the work force. Recruiting, training, and supporting agriculture education teachers can help solve many of the challenges agriculture is facing.

Following the three-component model, an agriculture education teacher can plan, instruct, and prepare in a way that all students can be successful. Teaching starts with training. Teachers can use tools from their educational career. With quality teacher education programs, agriculture education teachers should have the content knowledge to lead their students. Agriculture teachers must not become apathetic. As the agriculture industry changes, so must the teacher. Continuing education and profession development can be used by the agriculture teacher so they can stay relevant (Thorton, Coleman, Bunch, & Roberts, 2020). With content knowledge comes the opportunity to differentiate instruction to serve all learners. Agriculture teachers are responsible for meeting the needs of all students. To ensure all students succeed, teachers must be able to remediate students who struggle. This takes not only working content knowledge, but an understanding in learning styles and the learner's challenges. This ability allows the teacher's classes to progress, and it allows for rigor to be added to the curriculum. On the other end of differentiation is enrichment. Agriculture education classrooms are diverse, and the abilities of the students differ. Students, bored with easy material, can become behavioral problems, or lose interest in the material. If we need the best and brightest in the agriculture field, the teacher needs to keep those high functioning learners involved in the class and the agriculture education program. A way to encourage rigor in the classroom is the introduction of Science, Technology, Engineering, and Math (STEM) (Ferand, DiBenedetto, Thoron, & Myers, 2020). For this to be effective, the teacher needs to have a broad understanding of many contents. With this knowledge, the teacher can train the students to have the skills needed to be successful in the agriculture industry. Teachers can also change the instruction practices to encourage students higher order thinking skills. Problem solving skills, student centered learning, and experiential learning can all deepen the student's understanding of the concepts.

Besides understanding, this can encourage students to develop a sense of ownership in their education. This ownership is essential in promoting life-long learning in students. The proper training can allow the teacher to have a classroom where all students can be successful.

With quality students enrolled in agriculture education classes, it is the job of the agriculture teacher to recruit these students into the FFA (Hoover & Scanlon, 1991). The FFA chapter needs to be accommodating to all students enrolled in an agriculture education class. At the very least, the FFA can be the one place in school where that school can belong. The FFA should not be a merit-based club. This sense of belonging could be the difference in the student's ability to graduate. Once involved, students can be involved in peer instruction. This lessens the anxiety of learning things like public speaking, working in groups, or planning activities for a larger group. The teacher is responsible for training student leaders to help the FFA members growth toward premier leadership (Rose et.al., 2012). In the FFA, this group is usually the FFA officers. This group is trained to be allow the FFA to be a student led organization. If successful, a properly trained officer team can recruit their replacements for the future. Students are drawn to competitive programs. An agriculture education teacher needs to be able to train competitive CDE teams for a variety of reasons. CDE training can be the rigorous enrichment needed for advanced learners. When these students compete, and have success, this will draw more advanced learners to the FFA program. Drawing the best and brightest students can help ensure that agriculture has the workers it needs for the challenges of the future. Success in CDEs or LDEs can be an easy way to market the agriculture program to the school. Illustrating success of students can be an effective way to promote the FFA program to the school's administration. Administrators should help the teacher promote their FFA program to the community. Good will between the school and its community can help both

become partners for the success of the students. An effective FFA program is an asset to the students, school, and the community, but an effective teacher is an important part to the success of the program. The teacher must be able to recruit students, train them for the benefit of the program, and be able to market the FFA program beyond the classroom walls.

Beyond training students for success in schools, agriculture teachers need to be able to train students for success in their careers. Through experiential learning, agricultural education classes have trained students through Supervised Agricultural Experiences (SAE). This hallmark of agricultural education is mandatory for many students. Students have the freedom to plan this project to fit their own needs. Students can select to practice their agricultural mechanics skills, care for and exhibit livestock, or complete agricultural research to complete the project. The teacher's role in an SAE is supervisory. The teacher is there for support or guidance so that the student can be successful and illustrate growth in their SAE during their time in an agricultural education class (Baker et.al., 2012). Besides the experiential learning aspect, the SAE has other benefits to make students ready to enter the work force. Students learn about time management. The student is responsible scheduling work times. The beneficial skills of budgeting and accounting are exercised through the mandatory record keeping aspect of the SAE. The teacher is also responsible for providing the guidelines of the SAE. Time allotted to complete the project, how and what records are to be kept, and other documentation needed to be successful should be given in clear instructions by the teacher. To help students the teacher must work with partners to allow students opportunities to complete their SAEs. Many students use their SAE as career exploration. Job shadowing opportunities or Work Based Learning are examples of students receiving a "snapshot" of a career where they have interest. It takes a special relationship between the agricultural education program and community partners to give the

students this opportunity. This is not only important for students, but it provides the next generation of workers for our nation's largest industry.

Problem Statement

The three-component model of agricultural education instruction provides all agriculture education teachers with a template of how to teach. The template is proven to be successful as agriculture education's focus has remained the same for generations. Students learn skills in class through observation and demonstrations by the teacher, they practice those skills in a laboratory setting, and they can apply those skills through their SAE. All the while, the student is learning leadership skills through the FFA. This template has been copied throughout the educational industry, and it leads to better student understanding through the principle of application. If this template is full proof, why are some teachers successful and other teachers not? Which is the most important component of the three, and is that answer the same for every teacher? The answers to these questions could be useful to many people. Researchers studying teacher attrition could have another tool to work with. An understanding of the perfect balance in the three components could help teach preparation programs train their students for the classroom. The three-component model is a template but the percentages inside the Venn diagram could depend on a number of factors (community needs, administration expectations, or teacher preference) that could cause a teacher to not understand the template's meaning. Aspects of each of the three components differ as well. A teacher could see the importance of training CDE teams, but he or she could not see the importance of FFA meetings. By studying the aspects, researchers could find the disconnect between a teacher being successful or not, or the reason why a teacher left the profession or not.

In there being no prescribed percentage assigned to the three-component model, room is left for individualization according to the stake holders involved. The amount of time spent in each can be tailored to fit the needs of the agriculture education program. This fluidity is a good thing since the program needs to match the needs of the students, the school, or the community, but problems start to exist when the needs of each are not being met. If each had their say in the amount of time spent in each of the components, would they match? In communities where showing livestock is a tradition, would the school benefit from more time spent on the FFA program? If the change was made, how would the students react? If the community agrees with the students and the school, does their views match the teacher's view? If there is a discrepancy, many problems could occur (Hasslequist, Herndon, & Kitchel, 2017). An agriculture education program needs the support of the community to succeed. Members of the community are important partners for financial support, advisory committee members, and other supports needed for the program. Communities are more likely to support the program that seems to fit the needs of the community.

An important factor the determining the split between the amount of the components is the teacher's abilities. Teachers need to teach to their strengths. Teachers could spend more time on a component because they are more comfortable, or teachers could spend more time in an area in which they enjoy teaching. A teacher raised in a livestock barn will enjoy being at a livestock show over the weekend while a competitive teacher will enjoy training Career Development Event (CDE) teams to compete at the local, state, or national level. All people have facets of their job that they enjoy, and it is only natural for them to spend more time accomplishing those tasks. Job satisfaction is a part of agriculture education that has been studied immensely. Job satisfaction is an important topic because it can be tied to many other

factors often studied in agriculture education. Effective teaching and learning, teacher efficacy, and teacher retention can be affected by job satisfaction (Sorenson & McKim, 2014). Teachers will be more satisfied if their time is spent on the component they enjoy the most, and teachers will be less satisfied spending time on the component they enjoy the least. Why would a teacher spend the time working in the component they do not enjoy? There could be many reasons, but, in Georgia, all components are required. A teacher's pay is determined by their Program of Work (POW) (C. Corzine, personal communication, June 11, 2021). In these standards are tasks that ensure the teacher is spending time in each component. Mandatory lessons in FFA, leadership, and record keeping control the classroom instruction. Teachers document lesson plans or scored assignments to prove that those lessons are being taught. Teachers have a minimum amount of FFA meetings and CDE competitions in their standards. Teachers have to a least spend five afternoons with students competing, but most chapters take the CDEs very seriously and many afternoons are spent practicing for the CDE. Teachers are evaluated on the amount of productive SAEs their students have. This can cause long hours spent doing home visits or supervising students in the greenhouse, agriculture mechanics shop, or school farm. With a teacher's POW establishing the amount of extended day or extended year pay they receive, all components of the three-component model are mandatory.

Outside forces can also influence the amount of time a teacher spends in each component. A teacher's administration could feel that the classroom aspect is the most important. They could require weekly lesson plans full of differentiation, higher level thinking skills, and accommodations. The time spent designing these lessons will take time away from training a CDE team or monitoring SAEs. Historically competitive CDE chapters can expect many hours be spent after school training teams. Time spent in areas that the teacher could lead to poor job

satisfaction. Teacher efficacy could affect the amount of time spent in each component and have an affect the teacher's job satisfaction (Hasselquist et.al., 2017). In the case of the competitive CDE chapter, a teacher how is not comfortable in certain CDEs could be anxious to try and lead the team. This same discomfort could be experienced by a new teacher asked to run a livestock show team while having no experience with livestock. Job satisfaction will ultimately affect a teacher's ability to stay in the profession. Teacher retention is important to agricultural education because effective teachers leaving the profession have a ripple effect that is a disservice to the entire agriculture industry.

When an effective teacher leaves the profession, immediately there becomes a job opening. With more teachers leaving faster than suitable replacements graduating ready to teach there is a chance that the replacement will not be as effective. The program will suffer, and the students will find other venues to learn and spend their time. Students will not become more literate in agriculture. Our society will become more distanced from the land and its resources that are responsible for providing us with our food, fiber, and shelter. Without students, the administration will not witness the importance of the agriculture program. Core content will not be reinforced, students will not learn problem solving skills or leadership, and the program will not be bright spot in the communities' view of the school. Ultimately, the best and brightest will not look to agriculture as a future vocation. The average age of the American famer is approaching 60 and their replacements will have to feed more people with less land. The supporting jobs that encompass the agriculture industry will be left without new workers and even other industries will continue to struggle with a gap in the skills that workers have versus what skills are needed.

Purpose and Objectives

The purpose of this study was to describe Georgia's agriculture education teacher's belief of importance, and their perceived efficacy in, normal teaching duties that align with the three-component model. The study would also find what tasks teachers consider important and which tasks are considered highly important and have low efficacy. Six objectives were identified to guide the study:

1. Describe the personal characteristics of agriculture education teachers in the State of Georgia;
2. Describe the perceived importance of tasks and the perceived level of competence associated with the three-component model of agriculture education by teachers;
3. Describe agriculture teacher's perceptions on how time spent classroom activities, FFA activities, and SAE activities help serve their program;
4. Describe if agriculture education teacher's thoughts of the three-components change over time;
5. Determine the mean weighted discrepancy score by the teacher's perception of importance of each component and the teacher's perception of competence in each component;
6. Describe mean weighted discrepancy scores by teacher's level of experience;

These objectives provided the data necessary to gain an insight into beliefs and abilities of agriculture education teachers and their thoughts of the three-component model. The study will also provide necessary information into where agriculture teachers need training pertaining to the

three-component model. Discrepancies between level of importance and perceived level of importance can illustrate whether or not professional learning and teacher education programs are serving the needs of present and future teachers. Teachers had the opportunity to break down each component to individual tasks and evaluate the level of importance to them along with their efficacy in that task. Teachers could also compare where they are spending their time now versus where they would choose to spend their time optimally. The collected data will be used to promote professional development while accomplishing the specific goals of the study.

Significance of the Study

The agriculture industry needs the best and brightest students to solve the problems that the industry will face in the future. Future agriculturalists will have to be more efficient, more effective, and accomplish this without wasting our natural resources. As the population grows, we lose land and resources as urban areas spread into the countryside. The agriculture industry will be responsible for feeding a growing population while being scrutinized for its impact on the environment. The average person will not understand the pressure of growing more food on less land, but they will notice if the price of food increases. Having no experience in agriculture, the majority of the population will not understand the challenges farmers and ranchers face (Brune et al., 2020). The inputs of production are constantly increasing and the prices for the outputs are uncertain and fluctuate with markets. The average farmer is not a simple person sitting on a tractor, but they are workers who operate in an ever-changing business. Farmers must constantly be learning and trying new strategies to stay relevant in the field. The misconception that farming is a profession for the mentally, or socially, weak is a problem that could put the future of civilization at risk. Farmers are asked to be more productive every year while learning new

equipment and technology as they work. Our farming population is getting older, and we need qualified replacements to take on the challenge of feeding the world ("Ag snapshots", 2021).

Once food is produced, the challenge remains. The food must be transported and preserved to move throughout the world. Accomplishing this feat is many people who work for the benefit of the agriculture industry who are not farmers. These salespeople, engineers, and scientists are just as important to our food supply, and they are unnoticed as agriculturalists by society (Brune et al., 2020). For farmers to become more efficient, agriculture needs help from advances in science and technology. Students studying engineering and biotechnology will become just as important as the farmers. In future, every seed needs to germinate, and no food needs to spoil. Innovation is the key to the future. New methods and new equipment need to be developed, produced, and integrated into the agriculture industry. Working concurrently with these advances needs to be an understanding, and responsibility, with ecology. Agriculture has always lent importance to stewardship, but as the amount of arable land decreases, that importance grows. Agriculture cannot afford bad press as polluters or enemies to a healthy environment. Agriculture needs to be the driving force in preserving our natural resources. These challenges will not be overcome easily, but it is evident the caliber of students we need entering the agriculture field.

The type of students needed in the future of agriculture are versatile. To begin, we attract them in the first place. Students need to be drawn to an agriculture class because of its merit (Hoover & Scanlon, 1991). The courses need to rigorous enough to draw students who thrive in challenging situations. Once in the agriculture class they need to be taught the foundations of agriculture. Students need to seek understanding, and they must not settle for memorization. It is essential that students be able to use their knowledge to solve abstract problems. Students

should practice solving problems as it is a learned skill. Students should be presented with problems that are faced in the real world, and they should use the knowledge and skills they have to define a solution. This will produce the kind of problem solvers the agriculture industry will need in the future (Baker et.al., 2012). Students will need to be able to work with their hands. Many agricultural jobs greatly need students with skills that are no longer learned from home. Students will need to be able to produce more than ideas. Students will need to be able to communicate across many different avenues. As vertical integration increase, many different organizations are now responsible for making the same product. Communication is the key to ensure that certain objectives are reached. Through the three-component model of agriculture education, agriculture programs can produce these kinds of students. Students will learn their foundational knowledge in the agriculture education classroom. What students learn should be used rather than tested. Students need to take the lessons from those introductory classes, and they should be able to build upon that foundation until understanding, or mastery, is achieved. Students can practice skills learned in the laboratory setting. These lessons in a greenhouse, agricultural mechanics shop, or school farm all students to work on the skills that they will need to career ready in that discipline. Students' skills can be tested through their SAE. Students can work in their chosen field outside of the school day to evaluate their skill while getting an understanding of the workplace. This provides two benefits. Students can explore careers while evaluating the skills they have versus the skills and knowledge they will need in the field. Through FFA activities students will learn valuable skills like communication and networking (Rose, et.al., 2016). Students involved in the FFA will learn to work with others through CDE teams, committees, and officer positions. Students will learn skills like public speaking and record keeping through mandatory lessons dictated by the teacher’s POW. The three-component

model has stood as the foundation for agriculture education because it is an effective measure of teaching and learning. For the three-component model to benefit its students it needs an effective teacher.

An agriculture teacher has to be able to achieve many tasks. The ability to teach the content is only part of the job (Sorenson & McKim, 2014). The teacher must initially be a motivated recruiter. Students need to be drawn to agriculture education classes and the FFA program. Students, once involved, need to be evaluated. Students should be pushed to achieve at their highest potential. For some students, this could mean leading the organization and competing in CDEs at the national level, and some students may need experience in the skills needed for a career. To achieve this, the teacher must care about the students. The teacher must be honest enough to start them on their agriculture education journey from a start that will lead to success. For the honesty to take place, the teacher needs to foster a comfortable learning environment. Students should feel comfortable enough in that environment to want to be a part of it. Students need that place to belong. Once involved, the teacher must teach in a way that can reach a diverse group of students with diverse learning styles. Enrichment and remediation are commonplace in an agriculture education classroom with students who excel being asked to compete in CDE or proficiency areas. To be successful at levels outside of the school building, students need to be motivated (Copeland, Talbert, LaRose, & Russell, 2020). It is the teacher's job to inspire a level of commitment in students that is needed to be elite. This is another important aspect of recruitment. Elite programs will draw elite students. High achieving, hardworking students are what is needed to fill the future opening in the agriculture industry. For mastery to occur, the teacher must provide lessons using real world applications. Students will revel in the environment where they are taught why they are learning new knowledge or

skills with the opportunity to apply the skill. The teacher needs to network with partners to ensure that students can apply their skills in the real world. This takes organization and communication. Agriculture teachers must be effective communicators with students, parents, administrators, and other stakeholders for students to receive the optimum benefit from their agriculture education experience (Sorenson & McKim, 2014). In teaching, the teacher needs to have relevant content knowledge to deliver to students. Teachers must constantly learn for their knowledge to stay relevant. The agriculture industry is constantly changing, and the teacher must evolve to stay in touch. The most important aspect of an agriculture teacher must be work ethic. Teaching their students must be important enough to them that they are willing to spend all weekend at a livestock show or spend the evening hours training a CDE team. An effective, hardworking agriculture educator can help solve many of the agriculture industry's problems.

All students can benefit from an agriculture education class. No matter their chosen future vocation, students can grow through the applied classroom instruction. Be able to apply knowledge leads to an increased form of understanding. Learning problem solving skills can help prepare students for the real world, and they can be ready to make an immediate impact in the workforce (Bush, Friedel, Hoerbert, & Broyles, 2017). All professions need some type of communication skill. The biggest change that happens with agriculture knowledge is that a society removed from working the land gets reconnected with how their food is produced. Agriculture literacy is important for all members of society. An agriculture education background would make people informed consumers. Understanding what is involved in food could benefit one's health, finances, and wellbeing. Many people see the agriculture industry as a place full or branding. Consumers see natural or organic, and they immediately equate price to quality, but they are acting with emotion rather than logic because they do not understand the

differences. With knowledge consumers could support farms and farmers who mirror their own beliefs. Every purchase could become a vote for the type of agriculture they want to see practiced. Other votes are important too. Individuals could become more informed voters by learning about agriculture. Great amounts of individual's taxed income are allocated into the agriculture industry and the Farm Bill. A person uninformed about agriculture will cast a misinformed ballot when voting on agriculture related issues. Another political issue is the environment. Uninformed people paint agriculture as an adversary to ecology, but that sense is not entirely accurate. Agriculture does have its problems with staying environmentally responsible, but no profession needs healthy land more than agriculture. Many advances in environmentalism have come from agriculturalists who want to be stewards of the land they own, lease, or farm. Agriculture has traditional done a poor job in marketing their craft. With greater agricultural literacy and new students introduced to agricultural practices, a new generation could advocate for agriculture.

The three-component model is the foundation for agriculture education. It is taught to every student who is training to teach agriculture. It is passed on to their students once they become a teacher, and it is evident in FFA or agriculture education media and promotion. When it is represented, all three circles are equal. Young teachers are taught that those equal circles in the Venn diagram represent the complete agriculture education program. The three-component model becomes the visual representation of a complete agriculture education program. In a time when agriculture education is needed to be effective across all of education, how can manipulate the three-component model to fit the needs of communities, schools, teachers, and students. With people becoming more removed from the farm, agriculture education is needed to inform future workers, future consumers, and future decision makers about the advances agriculture

needs to make to serve a growing population. The agriculture education program needs to be fluid enough to tailor its classroom instruction, FFA activities, and SAE programs to fit the needs of the students and the needs of the agriculture industry. Only then will the population of future voters, consumers, and workers be literate enough in agriculture to make the decisions they will need to make in the future. Effective teachers will need the authority to change their program to help with their job satisfaction so that they stay in the profession and continue to inspire young people into careers in agriculture.

Effective teachers can make a program that students of all abilities can thrive in. Teaching and learning needs to occur across all three components for students to receive their greatest benefit. Quality classroom teaching is used as the foundation. Lessons must be relevant, interesting, and differentiated to fit the needs of a diverse group of learners. Once involved, students can gain leadership experience, career exploration, and accurate training through FFA activities. FFA competitions through CDEs or Proficiency Awards are where many students find their place of interest in the agriculture industry. Students then have the opportunity to apply their skills in real world applications through their SAE. These types of meaningful, engaged learning in all environments are one focus of the America Association of Agriculture Education (AAAE). The AAAE tasks themselves with evaluating current conditions dealing with the agriculture industry, agricultural education, and society, and they prioritize how research should be conducted in the future. Groups of agriculture education faculty and graduate students study important factors inside the agriculture education industry and attempt to ascertain how research can better the lives of people inside the agriculture industry and the general public. In 2016, the AAAE provided future researchers with twenty five research questions that grouped into seven research priorities. These priorities serve as the current research agenda for

agricultural education and should guide research strategies and practices for the years until a new research agenda is made (Roberts, Harder, & Brashears, 2016).

The research agenda made a research priority of meaningful, engaged learning environments across agricultural education, and that illustrates the significance of this study. Agriculture education needs to evolve to serve the students enrolled in its class, so those students will become interested in agriculture and want to be a part of the agricultural industry (Edgar, Retallick, & Jones, 2016). To meet the needs and interests of students we must know the needs and interests of students, and agriculture teachers understand the students in their class. It is the agriculture teacher on the front line, and they will learn how, why, and when their students learn. The teacher can then adapt their class and their instruction to meet the needs of their students. Through this study, researchers can begin to understand how teachers adapt the three-component model to fit the needs of their students. The needs and interests of students will continue to change as will the needs of the agriculture industry. Schools and communities will continue to ask for different measures from their agricultural education program, and the teacher should be fluid enough to meet their needs also (Hasselquist, et.al., 2017). To prepare teachers for these shifts, researchers and stakeholders need to be able to define how those shifts can take place. Every component of the three component is important, and understanding which tasks are the most important will help future teacher education programs to better prepare future teachers. Knowing which factors of the three-component model where teachers do not feel proficient could be used to guide professional learning in the future. The three-component model is the foundation of agricultural education, but teachers are not taught how it should be prioritized or how it can be manipulated to serve the teacher, student, or school. This insight into what teachers find important and where they need the most help. This understanding could be the

basis to teaching the three-component model in the future. Future teachers will learn what each component mean, but they could be taught about how the model can be used to develop the agricultural education program into the program that the students need for their future. This could help a litany of problems facing agriculture education. Students engage in effective learning will be more likely to stay in the agriculture education program helping enrollment. Enrollment in an effective program will be significant to research initiatives of the AAAE. Through this study, teachers will have the opportunity to reflect on each component and give feedback on that factor's importance and their perceived competence in that factor. This action will provide the teacher with an opportunity to reflect on the certain factors of their job. This reflection will provide a chance for each teacher to think about possible best practices in their own program. Their responses can be used to populate recommendations to other teachers about how to use the three-component model to develop a complete agriculture education program.

With no guideline of how to prioritize the three-component model given, teachers must be able to align their program with the needs of the school, community, and students, but they must also teach to their strengths. In Georgia, secondary schools are split between high school and middle school programs. Can the split between the components be different by grade, or ability, level? Georgia's FFA programs differ in setting also. Does a FFA program in rural Tifton need to be run the same as one in suburban Atlanta? Many factors must be investigated to try and draw an ideal for each area. When a discrepancy occurs, what are the implications on the school, FFA program, its students, and its teachers? Agricultural education has always had a problem with teacher retention. What effect does the three-component model, and how well it fits, have on a teacher's job satisfaction? This study will be able to define which component of the three-component model is most important to agriculture teachers. It is reasonable to assume

that teachers will find more job satisfaction operating in the component they feel is the most important. This study will also find which component teachers feel the least efficacy in. Feeling unprepared to perform the aspects of the job can lead to anxiety (Sorenson & McKim, 2014). Ultimately, teachers are working for their students, and how to we serve a millennial population that is generations removed from the farm. We need high achieving students to solve the problems that agriculture will face in future. Does a disconnect between three component model and the needs of today's students cause a lack of enrollment in agriculture education classes? If we can keep effective teachers in the classroom, and our programs fit the needs of today's students, we can use agriculture education to help train society to understand how important agriculture is to our day-to-day life.

Definition of Terms

1. Agriculture Education: Educational instruction in the field of agriculture that provides students with knowledge of the agricultural industry by developing their potential for premier leadership, personal growth, and career success through classroom/ laboratory experiences, FFA involvement, and supervised agricultural experience programs (National FFA, 2016a).
2. Agricultural Educator: An individual who provides a variety of educational experiences within the field of agricultural education (Phipps, Osborne, Dyer, & Ball, 2008).
3. Agricultural Literacy: "Agricultural literacy entails knowledge and understanding of agriculturally related scientific and technology-based concepts and processes required for personal decision-making, participation in civic and cultural affairs, and economic productivity" (Meischen & Trexler, 2003, p. 44).

4. American Association for Agricultural Education (AAAE): The AAAE is a professional society for faculty and graduate students who have a specific research interest in agricultural communication, education, extension, and leadership. These individuals work closely together to conduct social science research within the areas of food, agriculture, and natural resources. Together, these individuals compose the AAAE National Research Agenda (Roberts, Harder, & Brashears, 2016).
5. Career Development Event (CDE): CDEs provide students enrolled in agricultural education classes an opportunity to apply the knowledge and skills learned in the classroom in a competition with other students (National FFA, 2016b).
6. Curriculum: The information, activities, and experiences outlined by a specific educational program that students must engage in to accomplish the objectives of the educational program (Von Crowder, 1997).
7. Experiential Learning: Teaching and learning where students learn by doing. This type of education also teaches problem solving skills along the skills and knowledge assigned in the curriculum. It is best used with real world application (Kolb, 1984).
8. National FFA Organization, FFA, Future Farmers of America: An intra-curricular educational experience for students in grades sixth through twelve that makes a positive difference in the lives of students by developing their potential for premier leadership, personal growth, and career success through agriculture education.
9. School-Based Agricultural Education (SBAE): Formal instruction in agriculture, which is offered within a public school setting. Instruction contains learning opportunities for students in each area of agricultural education including classroom/ laboratory instruction, FFA activities, and SAE supervision. (Phipps et al., 2008).

10. Secondary Education: High school and middle school education and curriculum.
11. Smith-Hughes Act (1917): Federal legislation that started agriculture education, and vocational education in America's schools. The act provided funding to start training students for particular vocations in school (Phipps et al., 2008).
12. Supervised Agricultural Experience (SAE): A planned project for students to apply their skills and knowledge of agriculture and related skills learned in the classroom outside of the school day. SAEs are hands on learning experiences and take place in a real-world situations. Students are required to plan, execute, and record information, and the advisor, or another adult, will supervise the activities (Phipps et al., 2008).
13. Vocational Education: Education used as training for a particular career. The phrase has been replaced by Career and Technical Education or some similar form.

Limitations of the Study

There are limitations experienced with the study and its ability to generalize the responses of the population it studies. Most of the limitations are intrinsic and come from recording responses from a self-reported questionnaire. Exaggeration and selective memory can affect the data collected. Efforts were made in the designing of the questionnaire to ensure the collection of reliable data. Any study can be limited, but the following limitations to this study were identified because they could impact the quality of the collect data and its ability to answer the research questions.

1. The internal validity of the questionnaire could be limited by non-response error. Study participants were provided a clear purpose for the study, and follow-ups were given to urge the participants selected for the study to participate.

2. There could be underlying issues at the with the participants or the schools in which they work that could affect the data collected.
3. Every participant in the study are agriculture teachers from Georgia. All Georgia teachers have the same standards for curriculum and the same Program of Work. This limits the responses to one state, but the study, and its instrument and design could be used in other states.

It is essential to understand how limitations can affect a study, and how those same limitations can corrupt the collected data. The limitations above reflect the identified problems to the instrument used for the study and the population studied. Great care was taken to ensure that the data collect accurately described the population, and that the data collected could be used to solve the research problem.

Basic Assumptions

For this study to be helpful in all the ways listed above, it needs to have accurate data. To have accurate data, all of the study's participants need to answer the questionnaire honestly and appropriately. With all questionnaires, there is an assumption that all responses fit the needs of the study. The questionnaire was designed to limit confusion, and the questions asked would lead to honest and accurate responses. The goal of the questionnaire was to maximize the probability of accurate responses while limiting confusion. The study assumes that all participants are agricultural teachers in Georgia. The selection of participants was crucial in that assumption being accurate. The sample of teachers was evaluated to ensure that participants were classroom teachers in the agriculture education field. This could also lead the researcher to assume that the sample would be an accurate reflection of the entire population of Georgia's agriculture teachers. The sampling was done at random by randomly choose participants from

Georgia's North and Central region. The assumptions outlined in this section are crucial to the accuracy of the study. With the study aiming to investigate the problems listed, great care was taken to minimize the scope of the assumptions and to potentially lessen their impact. The aim of the researcher is to obtain accurate data from the response by the participants on the questionnaire, and for that data to contribute effectively into investigating the research problem.

Chapter Summary

Agriculture is one of our Nation's largest and most important industries. The future of our progress as a society will likely be influenced on how we solve agricultural problems going forward. The agriculture industry needs the best and brightest students to achieve success in the agriculture field. For the benefit of current and future voters, decision makers, and consumers, agriculture education is important. A certain degree of agricultural literacy is needed by our society to make the decisions that need to be made in the future. For agriculture education to be effective in attracting students and preparing them for the future, the instruction in those classes needs to be effective and efficient. The foundation of agricultural education instruction is the three-component model of agriculture education. A mixture of classroom/ laboratory instruction, FFA activities, and SAE programs make the ideal agriculture education program.

No percentages are given in the Venn diagram representing the three-component model. This leads to investigation of what is best for the program, teacher, and students. If all three are present in the curriculum, students should have proficient agriculture knowledge, the communication skills to lead, and should have taken their skills and knowledge and applied them in a real-world situation. These types of students are the ones that the agricultural industry needs to help in the future. This type of teaching and learning needs a qualified, effective teacher that can help students reach their potential. Quality students and teachers will make the agriculture

education program an asset for the school. This study seeks to understand how the mixture of the three components affects the agriculture program. By surveying teachers, we can investigate their feelings of importance in each of the three components. Teachers driven to help students succeed will know the importance of tasks associated with each of the three components. Teachers will also self-report their feelings of efficacy in tasks associated with each component. Any discrepancy between importance and efficacy could be the foundation of future research that would benefit agricultural teacher education programs, professional learning designers, and could lead to an increase in teacher's job satisfaction.

We need agricultural education to help solve the problem of agricultural literacy in the United States. This research is significant because by studying the foundation, we can make necessary adjustments to keep teachers in the classroom and maximize the benefits to the students. The information gathered could lead to better agricultural teacher education programs. By illustrating to future teachers how to align a mixture of the three components of their own program to meet the needs of their communities, schools, and students, teachers could be more prepared to enter the classroom. Professional learning opportunities could be designed to close the gap on tasks with high importance and low efficacy. This could lead teachers to feel more comfortable in their own ability to prepare students for the agricultural industry.

Chapter 2
Literature Review

Agriculture Education

When Europeans came to the New World, they adopted the agricultural practices of the Native Americans. In Georgia, Tomochichi helped James Oglethorpe by leading him to the fertile soils of what is now Savannah (Meyers & Williams, 2012). Agriculture education remain informal as our country grew due to its agrarian nature. When America urbanized, legislatures realized how important it was for the American farmer to be effective and efficient to feed a growing population. The Morrill Act of 1862 started agricultural education in Land Grant Universities (Rubenstein, Thoron, & Estepp, 2014). The design had two factors that would benefit the agriculture industry. New farmers would be better prepared for their career, and through experimentation, new techniques could be developed and disseminated to other agriculturists. This legislation allotted 30,000 acres per congressional seat to start a university in each state where students could learn about agriculture, mechanics, and military studies (The Morrill Act of 1862, S, 503, Sec. 4, (6)). This was a new variety of education as an institution. Before this, a university was a place for young men to expand their mind. Lessons included Greek, Latin, and ancient history. Universities of this time were there to benefit the upper class and not the population as a whole (Edwards & Herren, 2002). Justin Morrill of Vermont was the essential individual leading to the passage of this act. Following the Civil War, Morrill was able to get the signature of Abraham Lincoln (Croom, Talbert, & Vaughn, 2005). These Land Grant

universities would become important places as they were the organizations educating the common people (Edwards & Herren, 2002).

Following the success of these land grant universities, legislatures looked to promote science and technology in agriculture. New techniques and procedures were being found to solve many of the problems facing agriculture. The Hatch Act of 1887 provided the funding to establish experiment stations on the grounds of land grant universities. Students and teachers could research and experiment new strategies and evaluate their findings. Knowledge gained on these sites could be promoted around the state to help the agriculture industry advance to become more efficient and effective (Ball, Dyer, Osborne, & Phipps, 2008). To disseminate these advances to the public, The Smith-Lever Act of 1914 provided the funds to create the Cooperative Extension System (Ball et al., 2008). This created a partnership between the federal government and land grant universities. The two could join together to develop, test, and extend knowledge to the rural communities (Croom et al., 2005).

With agriculture education established as a need in our educational system, agriculture education, and vocational education, was at a crossroads as to how it should be taught. One line of thinking was that students enrolled in agriculture education should also learn traditional content education along with their lessons in agriculture. This would lead to educated, ingenious workers once they entered their chosen vocation. Students trained in core content would be better thinkers on the job, and they could use their skills in other contents for the benefit of their industry (Dewey, 1910). John Dewey (1910) believed that students educated in this fashion could be "masters of their own industrial fate (p. 411). Opposing Dewey was David Snedden. Snedden believed that vocational education needed no input from classic content, and that students would be more work ready if they were trained solely for the trade they were to go in to.

Snedden believed that students were preordained to a social level based on the development of their cognitive abilities (Moore, 1988). To aid in finding solutions to these problems, President Woodrow Wilson started the Commission on National Aid to Vocational Education. The Commission was chaired by Senator Hoke Smith from Georgia, but it also included Congressman Dudley Hughes and Charles Prosser. Senator Smith was then inspired by a presentation by Rufus Stimson about his project method of teaching (Moore, 1988). This had a direct impact on the resulting Smith Hughes Act of 1917. This act provided federal funding to states for the creation of vocational education programs in High Schools.

The resulting School Based Agriculture Education (SBAE) program began with a fundamental philosophy to educate students of all ages in agriculture and natural resources, prepare these same students for a career in agriculture, and to promote agricultural literacy (Phipps et al., 2008). As agriculture has changed, so has agriculture education. Agriculture education is flexible enough to serve a changing industry and different generations of learners, but the foundations of agriculture education remain unchanged. Learning by doing is a hallmark of agriculture education, and it is even the FFA Motto (National FFA Organization, 2021). Students are taught practical, and applicable, lessons in the classroom. Students are then asked to use their knowledge to solve a real-world problem that could face someone in the agriculture industry. To accomplish this, a student must be able to problem solve. This skill is practiced through abstract problem-solving lessons, and this is a skill will benefit a student no matter their future vocation. Students who excel in certain disciplines can compete in FFA CDEs to test their knowledge against other students. Finally, all students are required to complete a SAE. Students must plan, record, and complete an agriculture based project outside of the school day. This type of teaching and learning encompasses the three-component model of agriculture education.

Three Component Model of Agriculture Education

Ingrained in every agriculture education teacher preparation program is the Venn diagram promoting an equal distribution of classroom and laboratory instruction, FFA activities, and hands on learning through a SAE (Croom, 2008; Hughes & Barrick, 1993; Phipps, Osborne, Dyer, & Ball, 2008; Shoulders & Toland, 2017). The classroom activities are designed by the teacher, and students learn skills and knowledge about agricultural subjects through lecture, demonstration, guided and independent practice, and other forms of teaching and learning (Talbert, Vaughn, & Croom, 2006). The FFA activities teach students a variety of leadership skills and provides students an opportunity to apply their skills through competitions and award areas (Talbert et al., 2006). SAE work by students could then be done at home with the goal of the student applying their new skill or knowledge in a real-world application (Stimpson, 1919).

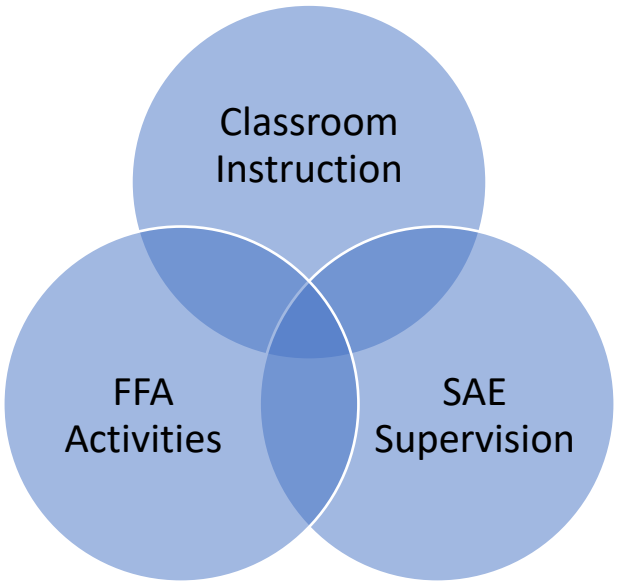


Figure 1. The three-component model of agricultural education (National FFA Organization, 2015).

The three-component model has adapted itself as the agriculture industry and agriculture education has changed. Glen C. Cook stated that there were four parts in his Handbook on Teaching Vocational Agriculture (Gordon, 2014). Classroom work, supervised farm practice, farm mechanics and extracurricular activities were the four tenants of agriculture education. The image of this type of agriculture education mirrors the agriculture industry of the time. America was more agrarian at the time, and many of the students lived on a farm. Also, the Future Farmers of America was young, so it was not named directly in the description (Croom, 2008; Phipps et al., 2008). Cook's version changed in the 1947 version when he identified classroom activities, supervised farming programs, farm mechanics, community food preservation, and Future Farmers of America activities. This would aim the goal of agriculture education to prepare current and future farmers to be proficient in farming (Wheeler, 1948). When America began to urbanize, agriculture education focused on agriculture as a whole rather than just farming. Later editions of the Handbook began to illustrate the complete agriculture education being equal parts classroom and laboratory instruction, FFA activities, and SAE (Phipps et al., 2008). The FFA began to promote this type of instruction as the complete agriculture education program. The three-component model has stood as the foundation for agriculture education teacher preparation programs ever since.

An equal distribution of the three-component model is still encouraged today, but teachers are given the freedom to adjust their focus on each component (Croom, 2008; Lewis, Rayfield, & Moore, 2012; Talbert et al., 2007). Torres, Ulmer, and Aschenbrener (2008) found that teachers spent 69% of their time on classroom activities, 23% of their time on FFA activities, and 3% on SAE activities. Other studies have also shown a discrepancy in the distribution of the components with teachers spending 49% on classroom activities, 36.4% on

FFA activities, and 13.9% on SAE supervision (Shoulders & Toland, 2017). However, agriculture education programs have a high degree of autonomy (Talbert et al., 2006). Factors effecting these decisions include student needs, teacher strengths, and community needs (Croom, 2008). The difficulty in managing the components comes from allocation of time. Agriculture education teachers are known for their long work weeks. Studies have shown that the average work week for an agriculture teacher can range from 55 hours (Walker, Garton, & Kitchel, 2004) to 49.4 hours (Torres et al., 2008). For the teacher to be successful, they have to find balance between their job and their life (Gilman, Peake, & Parr, 2012). The more activities, whether classroom, FFA, or SAE, means less personal time (Boone & Boone, 2009). Examining the three components does not account for all responsibilities of an agriculture teacher. Other time taking activities, such as school duties or contacting parents are included in time allocated for a school day (Murray, Flowers, Croom & Wilson, 2011). Assuming that an agriculture teacher can find balance between work and life, how does extra time in one area affect the other areas of his or her life. Ultimately, the success of the students, agriculture education program and the FFA comes from the effectiveness of the agriculture education teacher (Roberts & Dyer, 2002).

Classroom and Laboratory Instruction

The foundation of the three-component model is classroom and laboratory instruction (Terry & Briers, 2010). Today's students do not have prior knowledge of agriculture and its practices (Croom, 2008; Phipps et al., 2008). Teachers are responsible for delivering basic information to the students. An agriculture education teacher's reputation is largely built as an instructor (Croom, 2008; Hughes & Barrick, 1993; Phipps et al., 2008). This form of direct instruction was first labeled by Seigfried Englemann. It was theorized as a way for all students to learn through well designed, will executed instruction (Beteirer and Englemann, 1966). These

lessons are usually teacher centered, and the practices have their roots in behaviorism. This type of learning is effective because of the teacher controls the information and can adapt a logical, sequential order to its delivery (Stockard, Wood, Coughlin, & Khoury, 2018). The rote memorization used by B.F. Skinner is used so that students can understand foundational information such as vocabulary, safety, or common knowledge needed before a better understanding of agriculture can be built. The results of this type of teaching and learning have been found to be effective (Coughlin, 2014), and it can lessen the gap between sociodemographic groups (Stockard et al., 2018).

An updated direct instruction model follows a well-organized agriculture education class. The direct instruction model starts with introduction and review (Eggen & Kauchak, 2012). This would be similar to a study writing the notes from a teacher in lab safety. Students would then see safe laboratory actions modeled by the teacher, and subsequently, students would be guided through safe exercises. This is the teacher presentation and the guided practice phase (Eggen & Kauchak, 2012). Finally, students would get to practice a new skill or apply new knowledge associated with the lesson. At this point, the teacher is responsible for monitoring students toward mastery of the subject. This type of instruction is teacher-centered containing lecture and demonstration, and it continues to remain frequently used in SBAE (Colclasure & Thoron, 2018; Smith, Rayfield, & McKim, 2015).

Learning becomes more student centered after students learn the basics. At this point, the teacher becomes less of information giver and becomes more of a facilitator to knowledge and skills (Tobias & Duffy, 2009). At this point, students are asked to learn in a more constructivist manner. Constructivist learning is grounded in the works of Piaget (1952), Vygotsky (1978), and Dewey (1929). The key principle in constructivism is that students cannot learn through

transmission or absorption. Students must construct their own knowledge (Cobern, Schuster, Adams, Applegate, Skjold, Undreiu, Loving, & Gobert, 2010). Students come from different backgrounds, and they have different experiences that shape their understanding of the world. Their different experiences will change the way students process new information (Schunk, 2012). New information will be evaluated against their preexisting beliefs. Their new knowledge will be constructed by forming their new knowledge against what they have already experienced (Cobb & Bowers, 1999). Student centered education relocates the purpose of education to the student's thought process, and away from the acquisition of certain facts. The benefit of students learning in this fashion is that they will become more engaged in the learning process, and they be able to form knowledge in the future more efficiently as they experience new things (Doolittle & Camp, 1999; Easterly & Myers, 2011).

Both the behaviorist and constructivist thoughts are needed in agriculture education classroom instruction. Agriculture education programs use direct instruction, and when it is used properly, it has been proven to be successful (Kuhn, 2007; Schwartz & Martin, 2004). Agriculture education classes are promoted as experiential and hands on in nature (Phipps et al., 2008). This type of learning takes some degree of behaviorist teaching and learning. For agriculture education to make students work ready, new research suggests that learning take place in a more student-centered fashion (Hock, 2019; Thoron and Meyers, 2011; Colclasure, Thoron, Osborne, Roberts, & Pringle, 2020).

The integration of science, technology, engineering, and mathematics (STEM) across all curricula has affected agriculture education classroom instruction. Born through a deficit of qualified students entering the workforce, STEM integration works to benefit all students through including problem-based lessons in classes (Rice & Kitchel, 2018). Students educated

in this manner will be more likely to be successful in an economy in need of skilled professionals ready to meet the needs of their current industry (Marsh, Cotton, Hashem, & Dadson, 2001). Through this method, agriculture education classes can support core content classes through the integration of STEM principles (Ferand, et al., 2020). STEM is believed to have a natural place in agriculture. Laws of science and how math supports applied science is at the root of science's relationship to agriculture (Bowling & Ball, 2020). Evidence from past studies have shown that science integration in agriculture classes has propelled student performance (Roegge & Russell, 1990). This opens other opportunities to students. Agriculture education classes can serve as a reinforcement for core content while filling a student's resume with experiences, certifications, and awards that will help them in the future. This would not only allow for a student to gain understanding, but additional agriculture education classes could enhance the student's educational experience as well. (Stone, Alfeld, Pearson, Lewis, & Jensen, 2005). Swafford (2018) thought that STEM learning would be at the very center of the three-component model. Agriculture teachers commonly expect that STEM and SBAE have always worked closely together, and they believe that agriculture education was STEM integrated before the invention of STEM (Stubbs & Myers, 2016). While other areas have struggled with STEM integration due to a lack of a clear implementation process, agriculture education has not due to STEM alignment with areas such as agricultural mechanics, animal and plant science, and natural resource lessons (Wang & Knoblock, 2020). Some agriculture education classes now count for a student's science credit. This highlights the rigor of some agriculture education classes, and it cements the necessity of agriculture classes in schools to decision makers (Ferand et al., 2020). If the goal of agriculture education is to produce students who are college and career ready, agriculture education must embrace STEM integration to accomplish that purpose. Experiences

in agriculture education can carry far beyond the classroom by developing students into responsible citizens who can be competitive in a global economy, and they can use the skills learned to be successful in the workforce (Hughes and Barrick, 1993)

Supervised Agricultural Experience

Agriculture education and project-based learning have been intertwined since their inception. Initially, project-based learning in agriculture education took place on farms (Wheeler, 1948). SAE is defined as "the application of the concepts and principles learned in the agricultural education classroom in planned, real-life setting under the supervision of the agriculture teacher" (Talbert et al., 2007, p. 418). SAE programs are meant for the student to plan, execute, record, and complete a project outside of the school day. A student's SAE project is meant to be cumulative, and the project should show growth over the student's educational career. The successes of this type of learning are a hallmark of agriculture education, and its importance warrants the SAE a spot in the three-component model (Phipps et al. 2008). SAEs, when effective, give the student an opportunity to apply skills and knowledge in the real world. This opportunity allows the student to experience activities and situations that they would face in the industry. Application of skills leads to a deeper understanding of concepts taught. This understanding leads to a positive relationship between SAE involvement and overall student achievement in other areas (Cheek, Arrington, Carter, & Randell, 1994; Dyer & Osborne, 1995). SAEs are tools that can reinforce STEM areas as well. Studies have shown an increase in student achievement in the area of science (Ramsey & Edwards, 2004). The forgotten benefit of SAE involvement is that it gets students working. SAEs provide students with the chance to participate in hands-on activities that they might normally not try. Career exploration, manual

labor, and the practice of record keeping allows the student to mature as they work for the benefit of their project. SAEs by students have shown to have a positive impact on the local economy while students complete their project (Retallick & Martin, 2005).

Rufus Stimson is the father of the type of learning now contained in the SAE. Stimson (1919) described that education needed to take place on a farm, and it needed to be supervised from the planning stage until the completion of the project. The sites were described as plots of land at home that the student could apply what they have learned in the classroom (Stimson, 1919). This type of project was typical in a nation that still largely lived on a farm, but as society changed, so did the SAE project. When vocational education was needed to fit the needs of the urbanizing American culture, the home-based project was tailored to fit the needs of diverse student group (Hurt, 2002). SAEs evolved into less about farm practices and more about a way for students to acquire knowledge, learn new concepts, and explore the facets of the agriculture industry (Smith & Rayfield, 2016).

In its evolution, SAEs currently fit into one of six categories. Students can select to preform their work in a placement/ internship, ownership/ entrepreneurship, research, school-based enterprise, or service learning (Figure 1). SAEs in these areas will expand a student's educational experiences while building a link between what is taught in the classroom and real-world application.

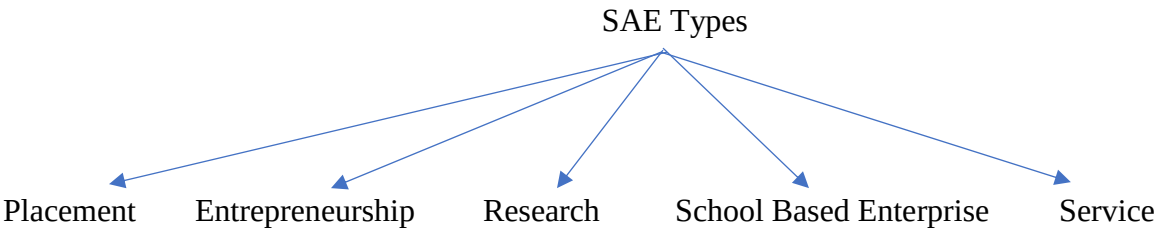


Figure 2: Categories of SAE projects for secondary students (Phipps et al., 2008)

This connection can lead to the student to find their agriculture education class, and education in general, more relevant. This deeper understanding of the concepts of agricultural education will continue to benefit the student long after their educational career (Phipps et al., 2008). It is not only the work that benefits the students. Students completing a SAE have to start in the planning stage. Students will pick a project largely on its availability or student interest. Students then have to practice time management to complete the project on time. This autonomy in the project helps the students mature by having the responsibility of planning and completing the work. During the completion of the project, students are required to record factors like time, cost, and profits. The independence gained through the process can lead students to be proud of their personal accomplishments. Students learning these types of skills will be able to use them as they enter the workforce (Talbert et al., 2007).

SAE projects provide students with a unique opportunity to gain experiences that they normally would not get to have. Today's students have lost some of the opportunities for work and experimentation that the generations before them could experience (Phipps et al., 2008). These experiences lend SAE to align with Dewey's learning model and Kolb's Experiential Learning Theory (ELT). Rooted in the constructivist works of Dewey and Piaget, constructivist theory is rooted in the fact that students learn from experiences that can be evaluated against their current view of the world (Kolb, 1984). The connection of new experiences to pre-existing

personal knowledge leads to a more functional understanding. This type of learning can be replicated in the future to make the student more able to add knowledge and skills in the future (Baker, Robinson, & Kolb, 2012). Dewey (1929) outlined student learning as guided by the scientific method. Learners will (1) fell difficulty or be uncomfortable in a situation, the more a student is unprepared, the more uncomfortable they will be. The amount of difficulty is what Dewey defines as a (2) problems location and difficulty. The next step is for the student to (3) suggest a solution to the problem. The student will need to (4) develop a reason why their solution will fit the problem they have been given. Finally, (5) further observation and experimentation will lead to the acceptance of the solution or the rejection of the idea. This problem-based theory allows students to become more comfortable in facing real-world problems. This skill in problem solving allows students to be successful in whatever vocation they choose in the future (Roberts, 2006). Kolb's theory shows the same extension from the classroom to the real world. In this method, students travel through the learning process by experiencing, reflecting, thinking, and acting (Kolb & Kolb, 2005). The learning through ELT has a greater attention on the process of learning, not the product. The ELT takes into account that all students learn differently, and students learn to adapt to new knowledge at their own pace (Kolb, 1984). Students completing a SAE project will face many of the same challenges highlighted in Dewey's and Kolb's work. Students will likely face an unknown situation as many students have little experience with agricultural work. Many students will not align their project with their ability, and they will face a novel obstacle that they will have to try and overcome. When their solution is tested, their choice can be evaluated as successful or unsuccessful (Blackburn & Robinson, 2016).

SAE is the hallmark of career readiness for students in agriculture education classes (Phipps et al., 2008). Real-world, abstract programs help students apply what they learned in the classroom to a culminative project. This type of learning has been identified by stakeholders as a means for developing the skills that a needed by employers (Haddad & Marx, 2018). Students completing their SAE build efficacy in skills such as occupational attitudes, record keeping, independent learning, problem solving skills, and communication. These soft skills have been identified by potential employers as skills needed to be successful in today's work environment. These employers view soft skill attainment through SAE as beneficial to students beyond high school (Dyer & Williams, 1997). Students enrolled in agriculture education classes who completed SAEs reported higher efficacy standards in many soft skills over students who did not complete an SAE. These students showed higher than average efficacy in areas like self-appraisal, problem solving, and project planning (Haddad & Marx, 2018). An important aspect of SAE participation is that it gives students the opportunity to learn to work. Legislation and society have made it harder for students to try careers while in high school. Many students first relationship with actual work comes from their SAE project (Dyer & Williams, 1997). When completing the project, students enjoy the opportunity to learn on their own, accept responsibility, develop independence, building a sense of pride, and learning to appreciate work (Pals, 1988). Pride, work ethic, and responsibility should be goals for every educational organization for their students. These kinds of students are ready to enter the work force ready to learn and make themselves assets to their workplace.

Industries need these types of students. The skills the students have that are graduating currently do not match the skills that industries need. Besides academic content, students need to have skills that are broadly accepted over a multitude of industries (Boahin & Hofman, 2013).

Being competent in these skills are deemed essential for entering any business. Through student's SAE, problem solving skills are taught through experiential learning. These skills have been grouped many ways by different research, but the most used is the following seven clusters; communication, decision making, self-management, teamwork skills, professionalism, prior experiences, and leadership skills (Crawford, Lang, Fink, Dalton, & Fielitz, 2011). A quality SAE can help in all of these skill as students will be able to apply them as they complete their project. Communication is important in any field. Whether written, oral, or through technology, communication skills should be a part of any SBAE class. During the SAE, students should be encouraged to communicate in a variety of ways with other students, the teacher, or another supervisor to accomplish the goal of completing the project. The mandatory record keeping lesson in an SAE allows the students to learn how to communicate in a new way. Accurate records are a hallmark of the SAE, and students must be able to illustrate the costs and time it takes to complete the project (Croom, 2004). Decision making, self-management, and teamwork skills also are a necessary part of an SAE. The student should in charge of choosing, planning, working, evaluating, and recording of the SAE project. These skills are not widely taught in core content classes as the standards and objectives of the class are paramount, and teachers guide students to the exact learning objectives of high stakes tests and local, state, and federal standards. The experiential learning of the SAE allows the student to control their own educational destiny. It is up to the student to make the decisions and manage their time. Teamwork can be part of the SAE project. At times the students will need the teacher, and the teacher will need the student. Organization from both parties are essential to the success of the project. The SAE allows the student to gain experience in areas where they may have career interest. At the very least, SAE projects allow for students to explore agricultural careers

(Phipps et al., 2008). The SAE project serves students by developing the skills they need in today's careers.

FFA

The Future Farmers of America, or FFA, was founded in 1928 by students competing in the American Royal Livestock Show. The students, gathered in Kansas City, Missouri were led to organize a national organization by Henry Groseclose. The organization was for the progression of white farm boys to become efficient and effective farmers in the future. As the nation changed, so did the FFA. Before integration, a similar organization started for African American students to have the same opportunities. This club was called the New Farmers of America, and many of the symbols and traditions mirrored the FFA. The FFA continued to grow to fit the agrarian landscape the United States was at the time. In 1950, Congress awarded the FFA a federal charter through Public Law 81-740. This allowed the FFA to become an intra-curricular part of education. Unlike extra-curricular clubs and sports, the FFA, and the lessons about it, became a part of all agriculture education classes. When American schools started to integrate, the FFA and NFA merged in 1965. Adopting traditions from both organizations, the FFA become equal to all males with farming as an interest. At the time, many FFA chapters had one female member that was elected via a beauty contest, and she would represent the chapter as the only female member. This changed in 1969 when females were allowed to join FFA and take agriculture education classes. Students were taught how to express themselves while learning leadership development. Students competed in everything from quartet to livestock judging, but many of the early contests taught students how to communicate to a large group. Some traditions stayed, but many changed to fit the needs of a changing society. While always serving the cause of agriculture, the FFA evolved to fit the needs of a new kind of student.

When Americans moved away from the farms, the FFA was there to serve students as at least a window into where their food comes from. The FFA now "makes a positive difference in the lives of students by developing their potential for premier leadership, personal growth, and career success through agriculture education" (National FFA, 2016a). The teaching of these agriculture education classes can benefit any student no matter their future vocation. The shift to prepare students for a variety of agriculture fields was evident when the FFA officially changed its name to the National FFA Organization in 1988 (Mercier, 2015). The name change reflected the fact that many students enrolled in agriculture education class no longer wanted to become farmers. The change also represented the change in the agriculture industry. With innovative technologies, and new methods, the agriculture industry was become more rooted in science and technology. With new, upgraded equipment, the agriculture industry needed a new group of students who could leave high school with technical skills and go to work repairing and maintaining those machines. Students needed to specialize in agriculture facets and terminology to be able to sell and provide the agricultural producers with technologically advanced equipment they needed. The FFA was able to use fluidity to change to fit the needs of agriculture and the American society.

At the very least, the FFA offers students a place to belong. Many students struggle in an educational environment. Many become disillusioned with school, and they many not finish their education. The FFA offers a place for students to set and reach goals, be engaged in meaningful activities, and increase their self-esteem (Croom & Flowers, 2001b). Students can find their niche in an agriculture education classroom. Once involved, the students can learn a litany of other skills, and the student can find a sense of ownership in their education. Rooted in the theories of A. H. Maslow (1943), the need to belong can encourage or interfere with human

development. Maslow's Hierarchy of Needs (1943) postulates that humans must have their basic four needs met before they can advance to higher order needs in the future. People must have their physiological needs met along with safety, love, and self-esteem. Then, they can advance to the abilities to know and understand, aesthetic, self-actualization, and transcendence. Students become eligible to join FFA at a crucial point in their progression towards development. Students need contact with others, a peer group, and a sense of belonging during this time (Croom and Flowers, 2001a). If students find their place to belong in the FFA, they can take advantage of many opportunities in the future. Once part of the FFA, students will have a new set of peer-aged models to mentor them. FFA programs have officers and leaders who can physically project the lessons of leadership to other members. The student will assimilate to the group, and those positive qualities of FFA members will become normal to the student. If the student takes those qualities to the rest of the school day, they could help the student stay enrolled in school and graduate. This is how the FFA can help students find the motivation they need to finish what they have started. As students have their needs met, the become more motivated (Maslow, 1943). Reaching goals through work caused by motivation is a learned skill. Once learned, those skills can be used in other educational areas to increase the chances of that student being successful. Ninety six percent of students agreed that the FFA has made their high school experience more enjoyable, and eighty nine percent of students call the FFA "home" during school hours (Rose, et al., 2016).

All through its history, the FFA encouraged leadership to its members. Developing the next generation of leaders for society should be the goal of every educational organization (Symonds, Schwartz, & Ferguson, 2011). Younger students have trouble understanding leadership if the lessons are not applied. Often gauged from an adult perspective, leadership

research has attempted to understand how the application of leadership educations related to student achievement (Whitehead, 2009). The inter-curricular FFA lessons in an agriculture education classroom helps students apply lessons in leadership. Students learn valuable communication, record keeping skills, skills in evaluation, and dependability skills. Students could compete in public speaking in a variety of ways, and the most active students were encouraged into leadership positions such as being a FFA officer (Hughes and Barrick, 1993). Through FFA experiences, students Leadership skills are needed in today's agricultural industry. The industry needs students to become individuals who become leaders in the work force, and that can handle to difficult issues that will face the agriculture industry in the future (McKim, Pauley, Velez, & Sorenson, 2017). This puts SBAE classes at the pinnacle for prepare students for the future as programs train students in not only the technical skills needed for the agriculture industry, but they train students in leadership (Connors & Swan, 2006; Morgan, Fuhrman, King, Flanders, & Rudd, 2013). Beyond the classroom students get more opportunities to sharpen their leadership skills through the FFA.

The FFA has many contests, conferences, and other events to help students strengthen their competency in leadership. Attendance in these events have many advantages. Being in a group, away from the school and your home town, allows students to be challenged at a different level than before. The group attending together has an opportunity to bond in ways that cannot happen during the school day and inside the everyday classroom (Townsend & Carter, 1983). Students attending FFA functions can also expand their view of the world. FFA trips are often the first time away from home, first plane ride, or the first time they have been introduced to someone from another region. Students who experience these types of events grow as individuals, and they are more likely to have success in other areas of their education. Students

with FFA leadership experiences feel more likely to pursue higher education (Rose et al., 2016). Through the FFA, students learn many of the soft skills that are needed for employment. Doerfert (2003) found that career skills sought by employers on an international scale rated problem solving as the most highly regarded. Along with problem solving comes the skill of critical thinking. Critical thinking cannot be taught through rote memorization. Critical thinking is only practiced through areas where students are removed from their comfort zone and asked to perform at higher level. Many times, these lessons will not be effective in a classroom environment. The FFA provides the opportunity for enlightenment because the FFA continually asks students to perform at a higher than local level (Dailey, Conroy, & Shelly, 2001). Students learn to work hard and become accountable. Students who compete at high levels are introduced to uncomfortable situations and have to adapt to achieve goals. Students reported that agreed their skill level in these areas through participation in CDEs. Students also reported increase in abilities such as self-discipline, reading goals, remaining dedicated to goals, and learning from failure (Rose et al, 2016). The FFA has an important role in SBAE and in schools. It is the place where students can find a place to belong. This sense of belonging can build a sense of empowerment in their own education. Skills are taught that will be useful for the student as they proceed through life.

The National FFA Organization currently has 700,170 members that span across the country and includes Puerto Rico and the Virgin Islands (FFA Statistics, 2020). The FFA prides itself on diversity. In 2017, 65% of FFA members were white, 11.5% hispanic, 6.1% other, and 3.9% were black. This is far removed from the all white male organization that the FFA was as recent as the 1960s. 55% of members are male (45% female), and that trend shows a growing

female population as agriculture, along with many other industries, is recruiting females to find a more diverse, effective work force (FFA Foundation Annual Report, 2017).

Agriculture Educators

The agriculture teacher is a very important facet to having an effective, rigorous agriculture education program. Agriculture teachers wear many hats, work long hours, and are dedicated to the advancement of the agricultural industry. The job of the agriculture education teacher starts in the classroom. The teacher must be proficient in their content to be able to make the class challenging and enjoyable. Most of the training the teacher will have received in the content of agriculture will have come from the agriculture education program that the teacher has completed in the past, and the teacher education program from which the teacher has, or will, graduate from. Once comfortable in the content of the area that needs to be taught, the teacher will have to understand the needs of their students. Students arrive in the agriculture classroom with different beliefs, abilities, and experiences than their peers. Teachers must use a variety of instructional strategies for fit the needs of all students. Instructional methods are tools that teachers use to guide students to a learning goal (Newcomb, McCracken, Warmbrod, & Whittington, 2004). Agriculture teachers use a variety of strategies to increase student learning. It is up to the teacher to meet the student where they are and then deliver them to the place where they need to be. To accomplish this, the teacher needs to be effective at instructional planning. Instructional designers must be diligent to plan the lessons that match the classroom and the students they serve (Dunkin & Biddle, 1974). This takes reflection on the behalf of the teacher. The teacher must get to know the students, and they must understand the student's ideas and motivations. Once learned, the teacher can design their instruction to meet the needs of the

students. This is true for all teachers, but agriculture teachers must go beyond the normal workday to complete their tasks.

What agriculture education teachers teach is important as well. The classes taught at the school level will fit somewhere in the National Agriculture, Forestry, and Natural Resources (AFNR) career pathways. These classes, taught in order will produce students who are college and career ready (The National Council for Agricultural Education, 2015). These pathways include Animal Systems, Plant Systems, Food Products and Processing Systems, Natural Resources Systems, Environmental Service Systems, Agribusiness Systems, Power, Structural, and Technical Systems, and Biotechnology Systems. The vast amount of information needed in each pathway makes it difficult for a teacher to be proficient in each pathway.

Agriculture, Forest and Natural Resources Pathways							
Agribusiness System	Animal Systems	Biotechnology Systems	Environmental Service Systems	Food Products and Processing	Natural Resource Systems	Plant Systems	Power, Structural and Technical Systems

Figure 3. AFNR pathways (National FFA Organization, 2015)

Teachers will invariably teach to their strength (Wang and Knobloch, 2006). In a perfect world, the strengths of the teacher will match the pathways provided by the school. If matched, the teacher will have the ability to feel comfortable teaching the classes needed for students to complete the pathway. If the pathways offered do not match the skills of the teacher, the teacher will need to be trained to become more proficient in that area. It takes a qualified teacher for the class to become rigorous enough to fit the needs of students (Leiby, Robinson, & Key, 2013).

The next job for an agriculture education teacher begins when the school day ends. They must manage and advise their FFA program and monitor students SAE projects. From CDE practices to home visits to assess student's SAEs, this is an essential part of the teacher's job. To first manage the FFA activities, the teacher will need to recruit students to become active. This means that the teacher will have to promote their FFA program. Promotion is not limited to the students the teacher needs for an effective program. The teacher needs to promote their program inside of the school. FFA programs have many moving parts. FFA advisors may need help judging a competition, help with fundraising, or help with finding chaperones for the next FFA trip. Promotion is essential for the outside world to help fit the needs of a FFA chapter. The promotion of FFA does start with the students. To be an effective program, the FFA needs effective students. While all agriculture education students should become FFA members, it takes special students to achieve special things. To attract high achieving students the program needs to be rigorous enough to interest and challenge those students. Once attracted, the FFA advisor needs to be able to place each FFA member where they can achieve the most success. Only then will the FFA program start to exceed outside of the school walls. When that happens, the school will benefit from the success of the FFA program. This will make a positive difference in the relationship between the administration of the school and the FFA program, but the promotion of the FFA to administration should start well before the great successes. Agriculture education teachers need to be able to convey even minor successes to the administration to strengthen that relationship and insuring future support. This relationship is an important aspect to the agriculture education program (Shoemake, 1972; Talbert et al., 2007). Local administrations will be more supportive as more students get served, and those students become successful. This type of relationship takes positive communication between the

agriculture education teacher and the administration (Boone & Boone, 2009. Administrators need to effectively communicate their expectations of the agricultural program to the teacher, and the teacher needs to communicate the program's success and struggles to the administration. The good will that starts in the school will travel to the outside community. Building a positive image of FFA and build good will in the community (Doss & Rayfield, 2021). Community relations is an important job of the agriculture education teacher and their FFA members. Many teachers work tirelessly in the community to ensure its support if the program ever needs it (Traini, Haddad, Stewart, & Valez, 2021). If the community supports the FFA program it will be easier for the program to get the things that it needs to successful. Many FFA chapters depend on community support for fundraising, volunteers, or as an advocate. Community service is a requirement for FFA chapters (Program of Work, Georgia FFA, 2017). This opportunity for students to work for the betterment of something bigger than themselves should be mandatory in all FFA chapters. Besides benefiting the students, the community will benefit from the work of young people. This will lead to support from the community.

Two important partners from the community for FFA are the FFA's advisory committee and the FFA Alumni Organization. These organizations made up of adults in the community were designed to support the FFA program and the agriculture education department. Through these organizations, the community will have the opportunity to communicate the needs of community from the FFA, and the FFA can communicate its needs from the community. An advisory committee is made up of community members who have a vested interest in the agriculture education program. Individuals from the agriculture industry, parents of agriculture education students, or representatives of post-secondary agricultural education organizations can meet with the agriculture education teacher to ask, and offer, help from the agriculture education

program. This acts as an oversight committee for the program. Members of the community can see what is needed in the industry they represent. They can evaluate if the agriculture education program and the FFA are teaching the things that are needed in the community. Then the committee can return the favor. These members of industry can help the agriculture program and the FFA get the things that they need. From volunteering at a FFA function to help finding, and buying, equipment, the advisory committee can help the program become the exact program the community, and its industries, need it to be. FFA Alumni Chapters are also made for the benefit of the agriculture education program and the FFA. Made up from former members and community representatives, this organization is there to support the FFA. Many times, this becomes the fundraising arm of the FFA. With less oversights from school boards and general rules, the FFA Alumni Chapter can help the FFA with funding when local, state, and federal monies fall short of meeting the needs of the program. Strong relationships with the school administration and the community are essential tasks for an agriculture education teacher.

Prioritizing the many aspects of an agriculture education teacher's job would start in the classroom. The classroom is where all successes from the other facets of the job begin. Rules and operations are learned in the classroom. FFA activities or SAE requirements are learned in the classroom. Later, the student will take that knowledge and apply it to FFA activities and their SAE. The job the teacher does in the classroom will be reflected in the successes of the students in other areas such as CDEs and SAEs. Ultimately, the teacher will be judged on their ability to lead a classroom. Assuming the teacher has the content knowledge to teach the subjects, the next decision the teacher will make is the type of instructional method they will use (Baker, Robinson, & Kolb, 2012). The initial information in a unit is often given via lecture. This type of instruction makes it easy to disseminate a large amount of information to a large

group of students. Safety and vocabulary can often be the subject of these lessons where foundational knowledge of a subject can be given. This type of teacher-centered learning marks the beginning of many lessons in agriculture education. From this starting point, the teacher will use other strategies to enhance student understanding of the topic. Many times in agriculture education, the next step is a teacher demonstration. The teacher now has the opportunity to model the behaviors, skills, and knowledge to the class. This addition to the initial lecture will fit the needs of visual learners. Once the students understand the knowledge or skill, they can begin the hands-on learning through supervised study. Ultimately, the teacher will guide the student through this guided practice until the student becomes proficient. This type of teaching and learning can be viewed in an agricultural mechanics class. The students will learn safety and other initial lessons through notes. The teacher may test the students to assess the understanding of these essential lessons. The teacher will then demonstrate things like proper placement of person protective equipment or how to properly set up a welding machine. Students are then given the opportunity to practice welding, and the teacher will be there to evaluate student progress. Through practice, the student will move through from beginning level welds up to more difficult welds as the student's skills increase. Other skills can be learned with other student-centered instructional techniques. Students can learn how to be successful in agricultural sales through role play. This gives students an insight into how salespeople fit the needs of their clients. Students can learn through experimentation. This type of learning is essential in training students to be problem solvers. The selection of the type of instruction can be based on the strengths of teacher, but the decision should be made by the teacher knowing which method will best help their students.

Agriculture education teachers commonly require students to apply their skills and knowledge through their SAE project. This student-centered project is a hallmark of agriculture education, but agriculture teachers play an important role in the project. Research has shown that the agriculture teacher has the greatest effect on SAE projects (Dyer & Osborn, 1995; Phipps et al., 2008). Success of SAE projects starts with the teacher's expectations for the projects. The teacher is responsible for setting the standard. Depending on the community and its students the teacher must define, in detail, what the SAE is supposed to be. SAEs in rural communities may look very different than in an urban environment, but the SAE project is essential in training students for success in the real world. Teachers often have a difference in the type of SAE they think is ideal and the type of SAE they will accept from students (Swortzel, 1996; Dyer & Osborne, 1995; Retalllick, 2010). Once the standard is set, the teacher must clearly and effectively communicate their expectations to the students, parents, and other stakeholders in the school and community. A lack of communication can cause SAEs to not be successful (Barrick, Hughes, & Baker, 1991; Dyer & Osborne, 1995). When the students understand exactly what they need to do to be successful, they can start the planning stages of their project (Rubenstein, Thoron, and Estepp, 2014). During the planning stages, the teacher needs to help the student by evaluating the student and their ability to complete their project. Resources, time, ability, and safety can often be misunderstood by students, and the teacher can be a valuable resource in helping students start with a plan that will lead to success. Aligning student interest and abilities to SAE projects is a concern for many teachers (Rubenstein et al., 2014). Once planned, the student can start their project. The teacher should be there to supervise and evaluate the project throughout the time the student is working toward completion. This supervision can take place at a variety of locations. Many times, teachers will visit the homes of the students who are

completing their SAE on their own property. Teachers may have to visit the student's place of work to evaluate a student doing an internship or using their job as their SAE project. Once the work is completed, the student and teacher still have an important lesson to complete. Within a SAE project, students are asked to learn the skill of record keeping. Taught in the classroom, then applied through the SAE, this lesson will benefit the student by allowing them to analyze records, learn financial management, and other employment skills (Retallick, 2010).

The agriculture education teacher is also tasked with running the FFA program. This part of a teacher's job is the center of fulfilling the goals of the National FFA Association (Talbert et al., 2014). Teacher responsibilities included in running a FFA chapter vary from teacher to teacher and community to community, but having an active, effective FFA chapter is essential to the success of the teacher, school, and community. The first priority would be to have and manage a FFA chapter where students could feel at home. When students become a part of organizations like FFA they are more likely to have a positive self-identity, less likely to have delinquent behavior, and they will benefit from positive relationships (Hansen, Larson, & Dworkin, 2003). To achieve these goals, the teacher must have a vested interest in the lives of their students. For the FFA chapter to be successful, the teacher must create an environment where students feel comfortable and can find a sense of belonging. Many students find their first taste of a positive adult role model in FFA (Eccles & Templeton, 2002; Larson & Walker, 2010). Finding this "home" inside of school is an important part of the student's educational journey. When a student becomes connected with something positive from school, they become more motivated to achieve in other areas of their education (Deci & Ryan, 2000). Agriculture education teachers must believe that they can make a positive difference in the lives of students. To make that difference, teachers must foster a mutual, caring relationship with those students

(Bowling & Ball, 2020). These relationships will lead to the students having opportunities to develop other skills that will benefit from in the future. Leadership is skill that is learned through FFA. Melendez (1996) defined leaders as "people of vision, effective communicators, effective decision makers, and intelligent individuals (p. 293)." Students lead the organization on the local, state, and national level. Students have the opportunity to see leadership from the FFA advisor and other students. Students initially learn leadership through the models they are given. Once a student feels comfortable enough in the FFA, they can take the opportunity to lead. The leadership ability of students and their personal development have been directly related to their activity level inside the FFA chapter (Ricketts & Newcomb, 1984). Activities such as CDE participation will better prepare the student for the contest related to the course curriculum, and it will benefit them in the future. Many teachers see this kind of FFA participation as important leadership training (Mckim et al., 2017). Through the FFA, students can become active members, chapter officers, or compete in leadership related competitions that will grow their skills and prepare them for their future.

Career Development Events are another opportunity for students to gain knowledge, experience, and skills. Aligned with SBAE standards, these competitions allow students to apply their knowledge of agriculture facets at the local, state, and national level (Ball, Bowling, & Bird, 2016). The teacher is responsible for recruiting, training, and managing these teams. Teachers and students must acquire greater content knowledge than normal classroom assignments to be successful in CDE competition. Many times, preparation for these contests happen outside of the school day (Melodia & Meyer, 2001). Whether a team or an individual, these practices require the teacher to extend his or her day for these teams to be successful. Conversely, many times these practices occur during the school day causing the teacher to have

to manage two or more groups at one time (Beekley & Moody, 2002). In recruiting the team, the teacher must have a solid evaluation of the students involved. When the teacher understands the strengths and weaknesses of the students, they have a better chance of aligning the student with a CDE where they can be successful. These evaluations can be based on learning ability, personality, or passed CDE activities. With students selected, the teacher must recruit students onto the team. A driving force of CDE participation is opportunities for student development (Ball et al., 2016; Russell, Robinson, & Kelsey, 2009). The teacher needs to promote the many different advantages to CDE participation to their students. The students will be more involved, and perform better, if they understand how the effort they are putting in will benefit them now, and in the future. Different students need different means of inspiration. Many students will choose a CDE that reflects a lesson they enjoyed in the classroom. With students already interested in the content, they can extend their understanding of the material through that CDE (Edwards & Booth, 2001). This becomes especially important when the skills of the CDE match the student's preferred future career. In a way, the CDE can act as career exploration by providing insight into the skills and activities of careers in agriculture. Some students will be drawn to the competitive aspect of CDEs. Students naturally want to compete, and they yearn for the acknowledgement gained through success. High achieving CDE team coaches report that the competition is the most important reason for student participation in CDEs (Croom, Moore, & Armbruster, 2009). When students compete in CDEs at the state and national level the program and teacher will benefit from the successes. The program will be highlighted causing good will from inside the school. The school's administration will be proud of the work of the students and the teacher. Inside of the classroom, more students will be driven to compete in CDEs and be a part of the FFA chapter. Higher achieving students will show more interest in the

agriculture education program due to its successes. Community stakeholders will take notice of the success and goodwill will come to the FFA chapter and the agriculture education program. Good things happen when trophies and banners are hung in the classroom (Russel et al., 2009).

Perhaps more important than where teachers are, is understanding how they became a teacher in the first place. Understanding the motivations of agriculture teachers is important because there has historically been a shortage of qualified teachers to fill the number of jobs that are available (National Research Council, 2010). In 2014 86 full time and 10 part time positions were left unfilled (Foster, Lawver, & Smith, 2014). As mentioned before, the AAAE has identified the need to have strong agriculture education programs, and we need qualified, effective teachers to make that happen. Finding, and keeping, teachers is an important topic to all stakeholders in agriculture education. Agriculture education teachers are most likely to come from some university agricultural teacher education programs. These institutions are tasked with preparing future teachers to be effective in SBAE programs (Roberts & Dyer, 2004). Students, who endeavor to become agriculture teachers, learn many things through their education. Students are taught pedagogical skills through their education classes. Some other classes included ensure that students understand diversity and how it can affect their teaching. Future teachers are also taught agriculture content that they can use in the classroom. The curriculum of these programs varies among colleges and universities with each aligning their content to the area in which they serve (McLean & Camp, 2000). Once trained, many teachers must complete a semester of student teaching. This allows the student to understand what it takes to be successful in an agriculture education classroom. This provides the preservice teacher with two role models to help them through. A cooperating teacher will be there for advice and support, and a faculty member will also assist the teacher with their initial lessons. This takes a

partnership between the college or university and local school districts (Gray & Walter, 2001). This stage of education is important because it ensures that the teachers graduating the program have classroom experience. This way of preparing students to become teachers is commonly known as the traditional route to teacher certification, but to fill the needs of empty classrooms, alternative routes to certification have been established. Alternative preparation routes commonly bring individuals in through the agriculture industry, and using emergency certification, temporary certification, or alternatively labeled certification pathways, allow the teacher to enter the classroom (National Research Council, 2010). Most teachers take the traditional route to teaching, but many programs find the value of the work experience brought into the classroom by alternatively certified teachers (Gray & Walter, 2001; Walter & Gray, 2002). Students, schools, and communities have benefited from having teachers certified through both routes, and the need for agriculture teachers is so great that new designs need to be implemented to allow more teachers into the classroom (Bowling & Ball, 2018).

Before a teacher is trained to excel in the classroom, they must be motivated to teacher agriculture. Many agriculture education teachers come from successful FFA programs. Students who enjoy and thrive inside of the program are driven to lead their own FFA chapter and agriculture education program in the future. Cole (1984) highlights the importance of prior FFA membership for future success as an agriculture education teacher. A love of FFA is a common theme found when researching the inspiration for become an agriculture teacher (Eck, Toombs, & Robinson, 2021). Teachers coming from FFA programs with a wealth of FFA experience understand what is needed to run an effective FFA program. They have already worked many hours outside of the school day to prepare for a CDE. They have content knowledge that they can disseminate to students in the classroom. These students have completed SAE projects, and

they understand the effort needed and the challenges that students will face when they complete SAEs for them. The reasons people choose to become agriculture education teachers can be found in their prior experiences in SBAE (Ingram, Sorenson, Warnick, & Lawver, 2018; Kaperbauer & Roberts, 2007). Studies have found that other motivators affect the decision to teach. These range from wanting to help students to gaining personal satisfaction from teaching (Gilad & Alkalay, 2014). Wanting to help students is a noble goal to strive for, and teachers need to be able to take satisfaction of teaching in leu of pay. Many teachers are passionate about agriculture and its future. Understanding the inspiration to teach agriculture could help recruit and retain teachers in the future.

The demographics of agriculture education teachers is changing to meet the needs of the agriculture industry. Once a predominately Caucasian, male occupation, agriculture education is becoming more diverse. This trend will help the agriculture industry by providing the different points of view that will be needed to help agriculture feed the population in the future. Studies of agriculture educators vary, but the trend of females joining the profession is clear. A study over twenty years ago illustrated that females made up 5% of the population (Knight, 1988). 13 years later, Camp (2001) illustrated a 10% increase from that account. Current studies show that females account for one third of all agriculture teachers (Shultz, Anderson, Shultz, & Paulsen, 2014). The increase in female teachers should help supply the female workers the agriculture industry needs in the future. Where agriculture education has advanced in becoming more diverse regarding gender, it has failed to become more diverse by race. 93.4% of the population of teacher education programs were white (Rocca & Washburn, 2008). Research indicates that this can be attributed from preservice teachers being form rural and suburban backgrounds which

trend to more White, non-Hispanic populations (Dilworth, 1989). To fit the needs of a changing audience, agriculture education needs to promote the profession to minority students.

With all the roles discussed, agriculture education teachers are busy people. Outside of their classroom teaching, they must advise the FFA program, supervise SAE projects, and complete many other tasks associated with the profession. It could be assumed that for an agricultural educator to be successful, they must be passionate about their work. The passion is what allows teachers to thrive in a difficult profession. The much-researched field of teacher attrition does not paint a glowing future. Forty percent of young teachers leave the profession before year 3 (Marlow, Inman, & Betancourt-Smith, 1997). Even students who intend to teach are being lost. Only 60% of students in teacher preparation programs are entering the classroom (Camp, 2001; Foster et al., 2016). Society needs the best and brightest to enter the agriculture industry, and to recruit these students, we need effective teachers. Once in the class, the students will need a teacher with high amounts of content knowledge. To have that content knowledge, the teacher will need expert training, and they will need the opportunity to practice those skills. This type of teaching and learning will only happen if we recruit, and keep, good agriculture teachers in the classroom. This trend could be the most important problem facing agriculture education today. "Numerous challenges continue to face the agricultural education profession, but none more important than the preparation and provision of qualified teachers" (Eck & Edwards, 2019, p. 12).

To understand why teachers leave or stay, the attributes of the job that cause satisfaction or dissatisfaction need to be investigated. Many of the factors seem obvious. The amount of work needed to be successful is great, and the return by way of pay is little, but the easy answer to the question is incorrect. Agriculture teachers reported being happy with their work (Gilman,

Peake, and Parr, 2012). People drawn to teach agriculture understand the work involved, and they can find value in things like student achievement, enjoying the process, or reaping rewards in other areas. Agriculture teachers take part of their pay in a form of compensation that is not money. The work hours associated with teaching agriculture is well noted. The hours associated with running a FFA program is a major challenge to agriculture teachers (Golden, Parr, & Peake, 2014; Gilman, Peake, & Parr, 2012). With these hours, many teachers have a hard time balancing their work and their life. Sorenson, McKim, and Velez, (2014) found that the average work week for the agriculture teachers they studied was 59.81 hours a week. Every extra hour spent at a livestock show or preparing for a CDE is an hour that will not be available for family, hobbies, or leisure. When teachers become focused on their work, it causes sacrifices to be made, and time is not infinite. When those sacrifices are felt, it could lead to the teacher becoming stressed, or the teacher could become less satisfied with their jobs. The ability to balance work and home is essential to the teacher feeling satisfied in their work (Blackburn & Robinson, 2008). The struggle to balance changes due to other factors changing in the teacher's life. Young teachers without the experiences of teaching through the years will have to spend more time preparing to teach and evaluating the results. Research has shown that younger teachers have a harder time balancing work and life (Grzywacz & Marks, 2000). They will have to make resources that other teachers have already made and saved. When the teacher becomes proficient, and things start getting easier, the teacher will get married, and their spouse will want more time with them. When the teacher finds balance with agriculture education and their spouse, a baby will come and create whole new challenges. Marital satisfaction of a spouse has been found to have a significant influence on the job satisfaction of the teacher (Odell, Cochran, Lawrence, & Gartin, 1990). Poor salaries and amount of workload are common complaints from

spouses of agriculture education teachers (Hopkins, Sorenson, Burrows, & Lawver, 2020). Many teachers include their families in their work to lessen the effect. Teachers include their spouses in training teams, or they start to bring their children to livestock shows to balance their lives. Newer research has found that many teachers fall into a trap of their own success. A teacher can start winning contests, or other awards, and they find it hard to lessen their workload (Traini, Yopp, & Roberts, 2020). Teachers overcome this by learning how to adapt to the job. Agriculture teachers show a high degree of adaptability throughout their careers (Traini et al., 2020). Teachers learn to delegate responsibilities to others to lessen the workload. Trusting students and community members to perform some of the duties of the agriculture teacher will lessen the amount of time the teacher is at school (Traini et al., 2020). Teachers also learn how to be more efficient. Using class time to achieve FFA goals is an example of how teachers can become more efficient (Hopkins et al., 2020). Differentiation in the classroom can help the teacher become more efficient and effective. Students working on different products with different processes allow the class to move through lessons while giving time and support to struggling students, and it allows higher achieving students to inquire into new knowledge (Traini et al., 2021).

Another need for teachers to feel successful is meaningful professional development. In designing these lessons, designers need to understand that teachers need different supports in different stages of their career. Teachers needs change as they progress throughout their career due to their differences in background and experiences (Cannon, Ktichel, & Duncan, 2012). For example, Figland, Blackburn, Stair, & Smith (2019) found that teachers with five years or less experience needed help in designing hands on learning simulations and managing facilities, teachers with 6-10 years of experience needed training in motivating students, teachers with 11-

15 years of experience needed guidance in designing online curriculum, and teachers with more than 21 years of experience needed training in instructional technologies. Just as teachers must meet students where they are, instructors and designers of professional development must take into account that teachers will need different supports as their career matures. Further research indicates the same trend. When teachers begin their career, their focus is on the classroom and the curriculum that they teach. Early career teachers need to identify themselves as professionals (Thorton, et al., 2020). These teachers are trying to find the art of teaching as their design their classes to meet the needs of students. Teachers will invariably find their stride, and they will understand what and how to teach through experience. Teachers will become comfortable in their teaching, and they will find discomfort in the aspects of teaching that are beyond their control (Thorton et al., 2020). Eventually, teachers will not be able to control the advancements in science and technology, and they run the risk of becoming disconnect from their students. These veteran teachers need to stay relevant through instructional technology to insure they are teaching the right things the right ways to today's students who are dependent on technology (Thorton et al., 2020).

The idea that there is complex variability along a teacher's career is supported by Dunkin and Biddle's (1974) model of teaching and learning. A series of variables exist between the teacher and the eventual achieve meant of their students. Presage, context, and process variables ultimately affect the product variable (Dunkin & Biddle, 1974). Presage variables come from the personal characteristics. Attitudes and experiences brought to the classroom by the teacher can have an effect on students. Context variables deal with the irregularities in the learning environment. School climate and policies will reverberate throughout each classroom. Process variables deal with the effectiveness of the class itself. Classroom management, student

motivation, and instructional decisions will ultimately affect the product variable which is student achievement (Dunkin & Biddle, 1974). Many of those variables will change during the career lifetime of a teacher. With experience, a teacher's presage variables will change. The teacher will grow and learn through their own experiences and a teacher can use those experiences to help their students. Context variables can change through building a school climate and culture. The teacher is responsible for the culture of their classroom, and they may have to overcome deficiencies in school policy. Teachers should be constantly evaluating their process to insure student learning. As teacher's grow, they will find the most effective and efficient ways to disseminate information to students.

With all the struggles associated with the job, it is important to realize the reasons that agriculture teachers stay in the classroom. There are reasons why many teachers stay resilient and remain to fit the needs of students. Many of these reasons are personal. Some teachers love the classroom, and they enjoy teaching students. Many teachers are passionate about aspects like exhibiting livestock, and they continue to teach so that they can stay involved. When the challenges of the job match the intentions of the teacher, career commitment can be elevated (Moser & McKim, 2020). Some teachers are motivated by the work, and their personal goals are only attained through parts of the job (Clemons, Hall, and Lindner, 2021). Student and program success can add to the work satisfaction of teachers. The environment in which the teacher works can make a difference on if they are satisfied or not. The climate of the school where the teacher works is important. Teachers need to feel as if they are part of a team. Within that team, mentoring needs to be available to the agriculture teacher (Thobega & Miller, 2003). Younger teachers and veteran teachers need to understand the norms of the school in which they teach. Teachers working together, no matter their content, can give the teachers involved a feeling of

support. That support allows the teacher to have the confidence to make a difference by aligning their content and their goals to the values of the school. Teaching within the guidelines of the school allows for a positive relationship between the teacher, their program, and the administration of the school.

For an agriculture education program to be successful, it needs the support of the school administration (Shoemake, 1972; Talbert et al., 2007). The administration is the decision makers of the school, and they are responsible for every facet of the operation of the school. With the support of these decision makers, the agriculture education program, and the FFA, can prepare students for their future successes. Support from the administration will help the program in promotion to students and the community. Having an administrator as an advocate allows the SBAE program to reach its potential. When the program and the administration share the same vision, the program will have an advantage in areas such as fundraising and many other facets of running an agriculture education program. Funding is an essential part of running any school program, and the administration are the gate keepers to local, state, and federal money. The relationship between the program and its administration is built on trust, and it can be fostered through positive communication. If the relationship is bad, the SBAE program will suffer, and it will not be able to reach its potential in relation to how the program can serve students, the school, and its community. The administration is responsible for setting the climate of the school (Barth, 1984). School climate is important because it effects how teachers teach, and how students learn. Positive school climate can lead to positive things like a feeling of autonomy among teachers to a sense of motivation to students. Negative school climate can lead to teacher attrition and student apathy (Rush & Foster, 1984). When the attitude of teacher conflicts with the vision of the administration, agriculture education teachers elect to take their abilities to other

industries (Boone, 2003; Boone & Boone, 2009; & Walker, Garton, & Kitchel, 2004). If the relation between the SBAE program and its administration is bad, it can be cause by several problems. Historically, principals and agriculture teachers do not share the same feelings about what is important. Administrators may not see the value in FFA activities and certain agricultural courses (Shoemake, 1972). A principal may not see the value in vocational education, or they may carry a stigma about career readiness in an area where college readiness is so important. Communication is the key to solving both problems. With communication from the SBAE program, principals will begin to understand how important the impact of the program can make on the school. When the FFA program starts to win awards, produce students with leadership, and makes a positive difference in the community, the principal should begin to understand the facets of agriculture education. Many administrators understand the scope of that positive impact (Kalme & Dyer, 2000; Rayfield & Wilson, 2009).

Teacher effectiveness is the ultimate judge of agriculture education teachers. In Georgia, agriculture education teachers are judged by the Program of Work by the Georgia FFA Association. This document, designed in the 1990s to protect agriculture education teachers from budget cuts, outlines the "minimum standards associated with being an agriculture education teacher" (C. Corzine, personal communication, August 31, 2021). Teacher standards account for many aspects of teaching agriculture, but it does not account for the three-component model equally. In the standards, five standards deal with classroom instruction, thirteen standards deal with FFA activities, and four characterize a teacher's work during the supervision of SAE projects (Georgia FFA Association, 2021). Classroom instruction standards deal with required lessons that all agriculture education teachers should teach. These skills have been identified as essential standards for agriculture education students to learn. Examples include the

mandatory lessons in leadership, record keeping, and lessons pertaining to the FFA (Georgia FFA Association, 2021). The standards pertaining to SAE supervision are less clear. Agriculture teachers must ensure that 60% of students must have in place an approved SAE project, and they must use a shared recording document for the student's recording keeping (Georgia FFA Association, 2021). If the SAE project is the hallmark of the experiential learning factor of agriculture education, why is 60% a level that is deemed successful? In today's society, the SAE is something that is being difficult to define. Is a student who owns a show cow the same as a child that plants one tomato plant on the balcony? If both students receive the same credit, then we are treating both projects as the same. Many teachers justify the pairing as that all students choose their SAE project and the choice for more work and money invested was the student's decision. All students may not be able to participate at high levels due to finances, but all students need to have a SAE project where they learn to work, record, and apply their knowledge in real world applications. This is why the SAE supervision for a chapter needs to fit the needs, capabilities, and beliefs of the community. With the proper alignment, SAEs could continue to be a major educational tool in the future. Most of the standards in the Program of Work deal with FFA activities. Teachers are responsible for conducting meetings, training officers, and competing above the local level (Georgia FFA Association, 2021). In CDEs, teachers are responsible for training teams and individuals to compete, but the kind of CDEs matter. The teacher must train certain amounts of teams (3) and they must have competitors in all facets of CDEs (at least two considered to be leadership affiliated) (Georgia FFA Association, 2021).

Agriculture Education Students

The end users of agriculture education are the students. Initially, it is high achieving students that are sought after for the agriculture education program. All promotions or marketing strategies should be tailored to fit their needs. Once involved, these students should be taught agricultural content along with other employability skills needed to operate in the real world. These are the students needed to help solve the world's problems as they pertain to agriculture. At the very least, it will make them literate in agriculture making them smarter consumers and knowledgeable of ecology. To get started, students need to be motivated to learn. Many students lack the motivation needed to succeed at school. Eventually, these students become labeled as underachievers (McCoach & Siegle, 2003). Teachers need to understand what motivates students so they can help these students find their place in an educational setting. Students can find motivation in themselves, or it can be inspired from outside sources. Intrinsic motivation comes from within. Students who want to learn for the betterment of themselves are intrinsically motivated. Students who want to learn for the rewards that come with success are extrinsically motivated (Bowling & Ball, 2020). When motivation is found, the beneficial things that come from agriculture education and the FFA can start through the classroom.

In the classroom, motivated students will find a wealth of opportunities in an agriculture education classroom. The content of courses will be relevant, taught in an engaging manner, and will be aligned to the region or community in which they live. Agriculture education classrooms are dynamic, and the challenges the students face will be for their benefit. With effective teaching, students will have the opportunity to achieve at high levels (Kaplan & Owings, 2002). At the very least, students enrolled in agriculture education classes should be versed in problem solving skills and literate in the realm of agriculture. The hands-on nature of agriculture

education allows students to develop the problem-solving skills they will need in the future. These skills are essential to everyday and professional life (Jonassen, 2000). The ability to be introduced to novel situations and to have the skills to succeed through those problems will benefit the students no matter their future vocation. Education today is filled with questions about rigor and application, and the problem-solving nature of agricultural education fits both needs. The students can also take the skills learned in agriculture and take them to other contents inside the school building. Agriculture education can support other classes. Mathematics are reinforced through learning how to read a tape measure in agriculture mechanics (Buriak, 1989). Many times, this is the first time that the student will truly understand fractions. Speaking skills are practiced through the leadership lessons learned through the FFA, and those skills will benefit the student in any class where they have to present or speak. Students who learn biology through agriculture achieve higher scores in biology, and they have a more positive attitude towards learning biology than students who did not have the lesson supported through agriculture classes (Roegge & Russell, 1990). Part of the success comes from students getting the opportunity to apply their knowledge in a hands-on approach. This type of learning fits the needs of more students. The notes and the demonstration will fit the needs of auditory and visual learners while the chance to apply the action will benefit the kinesthetic learners (Johnson, 1989). The chance for application through hands on learning allows students to have a better understanding of the subject (Lee, 1994). All of these beneficial things in the classroom can lead the student to more opportunities through agriculture education.

Primarily, agriculture education must train students to have the knowledge of agriculture needed to pass the class, but ultimately, it must train students to be work ready in a modern, diverse, and ever-changing workplace. To be work ready, students need to have the content

knowledge needed to start in the agricultural industry, but they also need the soft skills needed to compete in today's market. Soft skills include teamwork, ethics, work habits, and time management (McNamara, 2009). Having these skills is a tough task for a student at 18 years of age, but there are ways of students to practice these skills. Research conducted on people in leadership positions in the agricultural field found that "being dependable" was the most important skill that students can have once entering the work force (Easterly III, Warner, Myers, Lamm, & Telg, 2017). This skill is practiced through the student's autonomy in the SAE project. Students have the freedom to start and finish their planned work. In agriculture education's three component model, the SAE is designed to help the student develop not only content knowledge, but they can experiment with a career while developing those soft skills (Hyslop, 2008). This student planned, executed, and reported project can be instrumental in developing the skills that students will need in the future (Phipps, et al., 2008). Organization is a soft skill that is wanted by employers. In their SAE, students will be responsible for planning the project. Students will have to be organized to find the time to complete this type of learning outside of the school day. Students will practice work ethic and time management while completing the project. The mandatory record keeping in the SAE will benefit students in the future (Barrick, Hughes, & Baker, 1991). Students completing this project are more work ready.

Historically, students enjoy and benefit from their SAE. Students feel a sense of power over the project because of the responsibility they have in choosing and planning the project. Students also enjoy the ability to learn on their own, and they appreciate the project and gain pride of the completed project (Pals, 1988). A great benefit to students is, through their SAE, they learn to appreciate work (Dyer & Williams, 1997). Learning to appreciate work is an essential task for a student to learn before entering the workforce. The ability to find meaning in

work is a learned skill that allows the student to be productive. Many students first encounter with work is their SAE project. Students also reported that they gained problem solving skills, additional skill is self-appraisal, skills in planning, and occupational information while completing their SAE (Haddad & Marx, 2018). The soft skills mentioned previously are important, but the ability to explore a career is important to the student's future. Their SAE might give them insight into the skills and knowledge needed to serve that occupation in the future. The student will have the opportunity to explore other options if they do not enjoy the work being done. One unmeasurable benefit to students is the feeling of the self-esteem that comes with a successful, completed SAE project (Dyer & Williams, 1997). A tangible benefit to SAE projects is the compensation some students receive for their SAE. Many students earn money through the work associated with their SAE (Retallick & Martin, 2005). Students raising livestock can earn money through winnings or sales that the student can reinvest in the future. Students find woodworking or landscaping projects for others that pay. These students can learn about profits and loss. Many students are placed in or use their current job as their SAE. The added record keeping of these SAEs help the student with budgeting and financial planning in the future. With so much to gain, students need to be motivated to participate in an SAE project, and if they are motivated, they will be more willing to complete the project (Robinson & Haynes, 2011).

The SAE project can be students first experience with experiential learning. This pedagogical practice has been found to increase student's understanding, and experiential learning can increase a student's motivation to learn (Handler & Duncan, 2006). Experiential learning is considered a foundational skill in agriculture education (Roberts, 2006). The learning by doing aspect of agriculture education is the hands-on piece to the curriculum that attracts

students, prepares them with skills and knowledge, and allows them to ready for the workplace. Grounded in Kolb's (1984) cycle of experiential learning, all facets of agriculture education allow students to apply knowledge rather than rote memorization. Students learning in this manner learn valuable problem-solving skills. Learning through problem solving is essential to match the challenges of working in the real world. The SAE takes place outside of the control of classroom, and students must adapt to things like mechanical failure, sickness, and in climate weather to achieve that goal. This kind of ability has found to be "extremely important" to employers looking to hire students (Easterly III et al., 2017).

For the student to complete the three-component model they have to participate in FFA. Many different avenues can be taken to FFA membership, but it is important that the student participates in order to obtain as many benefits as possible. Students surveyed listed many reasons for joining FFA, and future vocational alignment was not a common reason. Students are motivated by their peers, and many students' responses reflected how important the impact of others is. Encouragement from others is a common reason for students to start participating in FFA (Phelps, Henry, & Bird, 2012). Friends, family members, and peers motivated these students to become FFA members. There is no better promotion than word of mouth from people close to students. Many students responded that personal gain was the motivator that led them to FFA membership (Phelps et al., 2012). Students understand that leadership opportunities afforded by the FFA looks favorable on a college application. Students want the notoriety that comes through the competitive nature of the FFA through CDEs. Many students are drawn to the FFA through the competition element of the FFA (Myers, Dyer, & Breja, 2003). Many students used the FFA as their place to belong (Phelps, et al., 2012). Students who join FFA should have an automatic social group that should have a positive impact on the education

and life. FFA meeting and other activities are designed to get students involved in their FFA chapter, school, and community. Fun and travel were also a common motivator (Phelps, et al., 2012). Many students first travel experience comes from FFA competitions and conventions (Dormody & Seevers, 1994).

If the student actively participates in the FFA, they can gain important skills such as leadership. The FFA is a student led organization, and its leaders exercise leadership skills to guide their FFA chapters to achieve goals. Leadership is a learned skill that can be learned systematically (Conners & Swan, 2006). FFA officer positions provide an opportunity for students to build leadership skills under a mentor. Unfortunately, there is a shortage of research about the outcomes of FFA membership, but many benefits can be assumed. Students who actively participate in CDEs will have worked on their agricultural content. This extra practice will make the student more proficient in that area. With proficiency comes students who are more work ready in that area. The students will also gain practical experience in hard work. To win, or be competitive in CDEs, the student will have to work at a level above what is usually required in the classroom. Work ethic and working toward goals is a great skill for students to have to enter the workforce. Students who work hard and succeed will be honored and highlighted by the school and community giving the student some professional equity moving forward.

Agricultural literacy

One important outcome of agriculture education should be to prepare our society to be agriculturally literate. Many benefits to society come with agricultural literacy. Society has adapted to where its citizens have no need to understand agriculture because our system is so effective. Individuals can just go purchase the agriculture products they need no matter the

season or geographical location. Historically, this is not normal because the seasons and the agricultural products of the region dictated the products that were available. With no need to understand agriculture, society now has little understanding of how their food, fiber, and shelter are produced (Sandlin & Perez, 2017). People literate about the production of food, fiber, and shelter can have a better understanding of their health, their finances, how food is produced, that production's impact on the environment, and the laws that govern how agriculture operates. This understanding is essential as our society moves away from the farm with a growing population. Currently, only 1% of Americans work on farms (National Agricultural Statistics Service, 2022). This disassociation from the land leads to misunderstandings of how food is produced. Society tends to belief only what they have heard or what they believe without having an experience with the actual field. People are inundated with news, social media, or the beliefs of others, and they assimilate to the information they are being given. Without firsthand knowledge, the media becomes the most influential source of information about food quality and safety (Verbeke, 2005). This can become a promotion problem for the agricultural industry. Agriculture has long been deficient in promoting their own ability to produce food, fiber, and shelter for our population. Agriculture is at the cutting edge of environmentalism and ecology. The land the farm owns is its greatest resource. This resource is so important that it needs to be protected at all costs. Advances in techniques, equipment, and technology allow today's farmers to produce more outputs while protecting the land they use. Unfortunately, many citizens show a lack of trust in our current food system because of misinformation from media sources (Beck, 2018). Although agricultural literacy serves many functions, lessening this gap between the truth and importance of agriculture and the misconceptions of society is the most important reason. The

importance of this is highlighted by the AAAE's first research priority. Public policy makers need to understand agriculture and natural resources (Roberts, Harder, & Brashears, 2016).

The world's population is estimated to pass nine billion people by 2050 (Doerfert, 2011). This amount of people needing to be fed will be a challenge for the agriculture industry. Feeding more people with less land seems like a hopeless cause. It appears there will not be enough land, not enough people working on the land, and no safe way to get food to the people who need it, but this problem is not one we can delay or give up on. This will be the biggest challenge for agriculturalists in the future. Some belief can be found when it understood that as many as 72 percent on people know nothing or very little about farming and ranching (Leising, Igo, Heald, Hubert, & Yamamoto, 1998). To feed nine billion people, there has to be some understanding of agriculture. Society needs to work together, with the best and brightest individuals leading, to find a way to feed a hungry, growing population. The first step would be to educate the masses to understand the processes and functions of agriculture. There have been efforts to expand agriculture education throughout the education system. Through Senate Bill 330, Georgia now has agriculture education throughout its K-12 system. Young students are more open to educational ideas through investigation and practice from elementary school through high school, and to eventually provide a knowledgeable consumer base (Jones, 2013). With education and training, these students will be smarter consumers. Understanding how food is produced will give them the knowledge and skills to make decisions in the marketplace. Understanding the differences between conventional and organic, or organic and natural, will empower that individual to make important decisions when it comes to their health and finances.

Agricultural literacy can also shape the face of the agricultural industry. Historically, agriculture has not been effective with its own promotion. With more and more people removed

from the farm, now is when agriculture needs a new marketing plan. Agriculture has come under fire with publications like *Fast Food Nation* (Schlosser, 2002) and *The Omnivores' Dilemma* (Pollan, 2006). Many other media outlets enjoy showcasing agriculture as the enemy of ecology and morals (Beck, 2018). Agvocacy is becoming a buzzword among the organizations that promote agriculture. Agriculture needs the students to advocate for its cause. The more students are educated about agriculture and its processes, the more they can understand their necessity. Once educated, these students can spread a positive image of agriculture to family, community, and society members. Any industry would suffer if only its failures were reported. Agriculture needs a media outlet that reports the absolute necessity of the work that occurs

Once society has a working understanding of agriculture, the industry can start to draw the elite students into fields where they can make the most impact. To achieve this, these students will need a higher understanding of agriculture. People involved in the agriculture industry must go beyond the basic understanding of agricultural vocabulary, but they need to understand the how agriculture works (Clemons, Lindner, Murray, Cook, Sams, & Williams, 2018). There is a difference in the amount of understanding it takes to be literate in agriculture and the possession of knowledge about agriculture. A vast number of students are needed in the agriculture industry, and they will need a variety of skills. It is not only production agriculture that needs a generational turnover. The industry needs problem solvers, communicators, and people versed in technology to achieve the goals being set by a rising population (Sargent, Pennington, & Sitton, 2003). Skills from across the educational spectrum will be needed to solve the problems agriculture will face in the future. Different skills that once did not lend themselves to the practice of agriculture will be paramount in fitting the needs of the industry. Blue-collar jobs and white-collar jobs will have to work together to meet the needs of society.

For these students to enter the agricultural field, they must first be recruited, then become interested, and ultimately trained with the skills that they need to be successful. Only 61% of agriculture jobs are filled with students with degrees in agriculture, natural resources, or other agricultural fields (Goecker, Smith, Fernandez, Ali, & Theller, 2015). The other 39% percent could have better trained for their new profession with some experience in agriculture education.

AAAE Research Agenda

Agriculture is a vast industry, and agriculture education covers a vast number of subjects to serve the industry. Agriculture education is responsible for forwarding advancement in itself, and the agriculture industry. For agriculture education to solve the complex problems faced by the agriculture industry, guidance is needed to direct studies to those problems. To provide this guidance, the American Association of Agricultural Educators (AAAE) prioritizes research to fit its agenda. Made up of university faculty and graduate students in the area of agriculture, the AAAE guides research to develop solutions that challenge the agriculture industry and the general public (Roberts, Harder, & Brashears, 2016). In 2006, the AAAE found reason to develop research priorities to provide coordination and communication to the research being conducted by AAAE members (Osborne, 2007). This coordination provided the direction for research to help solve the complex problems facing agriculture, agriculture education, and the societies' views of agriculture. In 2010, a new set of research priorities were produced to fit the changing needs of agriculture by making the priorities current and relevant (Doerfert, 2011). In 2015, the current version of the research agenda was developed, and it serves as the third edition of the AAAE National Research Agenda (Roberts, Harder, & Brashers, 2016).

To set the agenda, the National Research Agenda committee used a four-stage Delphi process to identify, categorize, and prioritize specific research priorities and questions to guide

research for the period of 2016-2020. The panel was made of AAAE members conducting research in the areas of agricultural communications, education, extension, and leadership and stakeholders who held positions that would have specific interests and insight into the challenges and problems that could be addressed by the AAAE research priorities. Twenty-five specific research questions were found, and they were divided into seven research priorities. Outlined in the new edition of the research agenda lend guidance to researchers in the areas including (1) Public and Policy Maker Understanding of Agriculture and Natural Resources, (2) New Technologies, Practices, and Products Adoption Decisions, (3) Sufficient Scientific and Professional Workforce That Addresses the Challenges of the 21st Century, (4) Meaningful, Engaged Learning in All Environments, (5) Efficient and Effective Agriculture Education Programs, (6) Vibrant Resilient Communities, and (7) Addressing Complex Problems. These priorities, along with the ten research questions found within the priorities, were deemed valid by the experts in the field, and it should be the focus of research during this time. To develop relevant research, research within agriculture education should follow the priorities developed by the National Research Agenda (Roberts, Harder, & Brashears, 2016).

The National Research Agenda provides AAAE members with a guiding document for its research selection. Research that seeks to answers the research questions included in the agenda will help further agriculture and agriculture education. The agenda is meant to be used by university faculty and graduate students to align their research with the research needed to solve the problems identified by the panel. The agenda can be used by stakeholders in agriculture and agriculture education to monitor the research being conducted. Many times, this could lead to differences in funding and support from other agencies to promote the research being conducted. The agenda also provides the subjects for discussion and collaboration. With the agenda set,

research can be duplicated, reviewed, and recommended across the country for the betterment of the problems facing agriculture and society. Because of the agenda's relevance, members can be assured that their research fits the needs of our food system, agriculture, and natural resources (Roberts, Harder, & Brashears, 2016).

The National Research Agenda provided guidance for this study especially in the area of having Efficient and Effective Agriculture Education Programs. Research priority #5 highlights the needs for effective teaching and learning. The preparation of the teacher is essential in providing communities with efficient and effective agriculture education programs. Ultimately, the teacher is the most important cog in wheel of agriculture education. The teacher needs to be fluent in content knowledge, have the ability to recruit students into the program, and he or she must be able to design curriculum that keeps students involved while teaching them the lessons needed to work in the future. The next step is to recruit the students into the program that can help the program grow. Agriculture teachers need to provide a rigorous, effective classes to draw high achieving students. Once enrolled in an agriculture education class, these students can be trained to be the kind of workers needed in the agriculture field in the future. These work ready students, who have been trained by an effective teacher are the workers that agriculture needs in the future. Students enrolled in an agriculture education class are more ready for the workplace. These students, through experiential learning, have more ability to problem solve than their peers (Thoron & Myers, 2011). This skill is essential in every career, but it is especially important in the agriculture industry where all the easy problems have already been solved. Students learn to lead through the FFA related to an agriculture education class (Martin & Kitchel, 2015). Leadership is another skill that translates among a wide array of career choices. Students who specialize in agriculture education receive essential work and life skills

through competing in CDEs (Ball, Bowling, & Bird, 2016). With the need of the agricultural sector, and the benefits to the students served, agriculture education needs to a diverse as can be (Mercier, 2015). Reaching more students is essential for the future of agriculture.

Quality students need quality teachers. Agriculture teachers need to be well trained in a variety of subject areas. The subjects taught in SBAE programs need to match the needs of agriculture, the students, and the community the school serves. Teachers also need to possess the social and personal skills to model for students (Hughes & Barrick, 1993). Agriculture teachers have many avenues for training. Most go through established teacher education programs, yet many come to profession through the agriculture industry and are alternatively certified (Barrick & Garton, 2010). Once trained, teachers need to be lifelong learners to stay relevant with the ever-changing agricultural field. Teachers need to stay abreast of the advances that shape the agricultural field. With this determination to learning for the betterment of their students, teachers can feel solace that they are serving the students they teach (Shoulders & Myers, 2011).

The three-component model of agriculture education serves as a foundation for agriculture education by showing how the student will benefit the most by receiving classroom instruction, FFA activities, and SAE projects (Talbert et al., 2006). If this is the foundation for agriculture education programs, and we need effective and efficient agriculture education programs, more research is needed on how to use the three-component model to its most effective and efficient manner. While every future teacher is taught the three-component model, how is it taught? The Venn diagram representing agriculture education appear to be equal, but is that the best for all students, teachers, and programs? Can teachers adjust the components to fit their strengths and weaknesses and the needs of the community?

Chapter Summary

Agriculture education has long been responsible for training the producers of our food, fiber, and shelter. Starting with the very practical applications necessary for a head of household to feed and care for their family. As science and technology integrated into agriculture, agriculture education adapted to serve the public with experimentation and extension. Along the way, agriculture found financial support from the Federal Government. Agriculture education found its way into secondary schools, and the masses found their way into an agriculture education class. The foundation of the agriculture education became the three-component model. It illustrates that students receive the most benefit from equal parts classroom instruction, SAE, and FFA activities. The classroom instruction will provide the student with a conduit to receive new skills and knowledge from the teacher. The student can then apply their knowledge in a real-world setting. Along the way learning work ethic, job skills, and life lessons through their SAE. Proficient students can then showcase their skills against other students from across the nation through FFA activities. The FFA, at the very least, will provide students with a place to belong, and they will have some reason to come to school. Students will also learn valuable leadership skills through FFA involvement. The three-component model is a tradition of teaching and learning that has worked for the benefit of many students.

Classroom instruction is where the three-component model starts. Teachers need relevant content knowledge, and they need to able to disseminate that knowledge in a variety of ways to fit the needs of a diverse student group. Instruction needs to be rigorous, enjoyable, and designed to fit the needs of the students, the agricultural industry, and the community. SAE projects are where students get to learn autonomy in education. This project, steeped in experiential learning, allows the students to explore careers, find empowerment in their

education, and apply their knowledge in the real world. FFA activities allow students to learn leadership skills. Students can learn to work in a team setting, and they can set lofty goals that may not be available to them in other parts of the school.

Agriculture educators work many hours for the benefit of their students. Part teacher, part coach, part recruiter, and part friend, agriculture teachers wear many hats. The teacher must draw students to their program. Students are drawn to successful programs, and the teacher must promote their program to students in a positive way. Once involved, the teacher needs to have a working relationship with student effective enough to put that student in the right place to ensure success. Successful students will draw more students wanting the same outcome. The teacher needs to operate within the mission and vision of the school. The administration needs to be proud of the agriculture education program. If there is a positive relationship between the administration and the program, support will come. The agriculture teacher needs to be a pillar of the community. The community served by the agriculture education program needs to have good will for the program. Ultimately, it is the students who are the most important, and the community will embrace a program producing productive students.

Students that have enrolled in agriculture education courses will be problem solvers with skills that will help them in their chosen vocation. They will be leaders who can work within, or lead, a group to achieve goals. They will have skills and knowledge from the classroom that they can use in their daily lives, and they will have the employability skills needed to be successful. Students will be comfortable with goals that are difficult to achieve, and they will have the tools needed to operate in an abstract environment that is the modern workplace. These students will literate in agriculture. Understanding of how agriculture relates to their health, environment, and politics will help them to have an opportunity to educated consumers, voters,

and advocates. The National Research Agenda from the AAAE is correct when it highlights the need for Effective and Efficient Agriculture Education Programs. The world needs to be educated on the most important industry. For programs to reach their greatest potential, we have to examine the foundation of agriculture education, the three-component model.

CHAPTER 3

METHODS

Introduction

The purpose of this study was to describe the agriculture teacher's feelings of importance of aspects of the three-component model, and to describe the teacher's efficacy in these tasks. The research objectives that guided this study were:

1. Describe the personal characteristics of agriculture education teachers in the State of Georgia;
2. Describe the perceived importance of tasks and the perceived level of competence associated with the three-component model of agriculture education by teachers;
3. Describe agriculture teacher's perceptions on how time spent classroom activities, FFA activities, and SAE activities help serve their program;
4. Describe if agriculture education teacher's thoughts of the three-components change over time;
5. Determine the mean weighted discrepancy score by the teacher's perception of importance of each component and the teacher's perception of competence in each component;
6. Describe mean weighted discrepancy scores by teacher's level of experience;

Research Approach/ Design

This study used a quantitative methodology. Quantitative research is focused on measuring social reality. Using data generated from studies, quantitative research can answer questions or support, or defend, hypotheses (Ary, Jacobs, & Sorenson, 2010). Using numerical data, quantitative research focuses on the cause-and-effect relationships of variables in an effort to explain the relationship (Ravid, 2011). The goal of quantitative research is to find patterns through the research of a sample population. Using this research fashion, researchers can use a small group of people to make inferences about the population as a whole (Holton & Burnett, 1997). There are different types of quantitative research including survey research, correlational research, experimental research, and casual-comparative research (Sukamolson, 2007). Participants in this study entered data into the online questionnaire through Qualtrics. This study's data that were collected, its guiding principles, and its research objective led to the selection of a quantitative approach.

The study was descriptive and correlational, and it used a quantitative non-experimental survey research design. Participants completed a three-part questionnaire after being selected into the sample population. The first section of the questionnaire was designed to collect data on teacher's perceptions of importance tasks within each component of the three-component model. Using a Borich scale, teachers were then asked to rate their level of competence in those tasks (Borich, 1980). The second part of the questionnaire was designed to collect data on the teacher's actual focus of each component versus what the teacher determined would be the ideal focus for an agriculture education program. The last section of the questionnaire collected data on the participants personal characteristics. No variables within the study were manipulated making the design of the study non-experimental.

Population and Sample

The population for the study was agriculture education teachers in Georgia (*N*=487). A simple random sample (*N*=101) of the population was calculated using Cochran's (1997) sample size formula for continuous data and minimum return sample size. Cochran (1997) presents a formula to determine sample size and minimum return sample size using two key factors, " (1) the risk the researcher is willing to accept in the study, commonly called the margin of error, or the error the researcher is willing to accept, and (2) the alpha level, the level of acceptable risk the researcher is willing to accept that the true margin of error exceeds the acceptable margin of error" (p. 44-45).

$$\underline{n_0} = \frac{t^2 \ X \ S^2}{d^2}$$

Where

- $\underline{n_0}$ is the minimum estimated sample size
- "t is the value for selected alpha level"
- "$\underline{S}$ is the estimate of standard deviation"
- "d is the acceptable margin for error" (Bartlett, Kortlik, & Higgins, 2001, p. 47)

"If the sample size exceeds 5% of the population, Cochran's (1977) correction formula should be used to calculate the final sample size."

$$n_1 = \frac{n_0}{1 + n_0/Population}$$

Where

- "n_1 is the required return sample size"
- "n_0 is the required return sample size according to Cochran's formula" (Barlett, Kotrlik, & Higgins, 2001, p. 47)

Students are the end users of agriculture education, and the program, and its curriculum, must fit the needs of the students. Agriculture education programs also must meet the needs of the school in which they reside. Agriculture education programs can be an asset to their school because of student achievement and the kind of work ready students that agriculture programs produce. When schools become supports of an agriculture program, the community will follow. Community support is essential for an agriculture education program to be successful. Students, schools, and communities differ depending on socioeconomic conditions, geographic location, and community traditions. Therefore, agriculture education programs must be fluid in their design to fit changing conditions while serving the needs of all parties involved. For this study to illustrate the diversity of the State of Georgia, participants were selected from all three regions and six areas of the state. Current agriculture teachers were selected into the sample population.

Using the State Directory from the Georgia FFA Association website the researcher selected teachers from the list. To ensure randomization a predetermined number was established so that every fourth teacher was selected. Once selected, the research created a spread sheet where participants name, school, region, and website were collected. Participants were collected until a sample population (n=101) of was completed. This amount was selected by using Cochran's (1977) formula for continuous data and minimum return sample size. In social science, it is understood that voluntary questionnaires rarely yield a 100% response rate. It is considered standard practice to oversample to account for non-responses when using a

voluntary questionnaire (Salkind, 1997). The sample size was concluded to be sufficient with the normal response rates of social science, so the list was finalized at the completed rate (n=101).

The teachers selected as participants were contacted through the Qualtrics platform. Teachers received an email with information regarding the rationale for the study, a link to the information letter, and a link to the questionnaire. Follow up emails were sent weekly to the email recorded through the Georgia FFA Association website. These reminders were only sent to teachers who had not started or completed the questionnaire. A subsequent thank you email was sent to the participants who had completed the questionnaire. Many of the emails, controlled by local Boards of Educations, did not receive the emails due to the large number of recipients. Once this was found by the researcher, a custom invitation link generated by the Qualtrics platform was generated and sent to the teachers individually. The reminder emails were discontinued, but the links remained active when responses ended (N=83).

Instrumentation and Data Collection

To gather relevant data, a questionnaire was designed using Qualtrics. This would allow for teachers to respond with the information needed to address the research questions and purposes. The collection period lasted for one month at the beginning of the 2021 school year (February 2021). Teachers were able to complete the survey in fifteen minutes on many different devises, but it was recommended by the researcher that teachers complete the questionnaire on a computer due to the large visual size of the Borich's Needs Assessments Model on Qualtrics platform (Borich, 1980). Collecting data through Qualtrics eliminated the need to mail questionnaires or produce hard copies of the questionnaire, so no data had to be extrapolated upon completion. All data received through responses to the questionnaire were

kept in Qualtrics until all responses were received. All submissions were anonymous, with the identity of the respondent coded with a number. The research was reviewed and approved by the Office of Research on Human Subjects, IRB# 20-573 EX 2012.

The questionnaire stated with a question that allowed participants to record their favorite component to spend their time involved in. Teachers could choose to record a response of classroom instruction, FFA activities, or SAE supervision. Once completed, teachers were asked to rate the importance and their level of competency in common activities that fit inside the tasks of a teacher in each of the three-component model. Tasks were selected by the researcher, and they were grouped into each component of the model. Participants reviewed tasks in classroom instruction, FFA activities, and SAE supervision in that order. Participants recorded their beliefs on importance and competency in a Likert style portion. The last section of the questionnaire collected personal information on Georgia's agriculture education teachers. The benefit of a web-based questionnaire was the reach it provided to the research. Teachers surveyed come from different areas, and they teach in communities that differ from one another. This allowed for the research to more accurately represent the diversity of the population of Georgia's agriculture teachers.

Using Borich's need assessment model allowed for the collection for large amounts of data directly from agriculture teachers. When reviewing the importance of tasks within the three-component model, teachers were allowed to rank each task. This ranking can allow the researcher to understand which tasks are seen as important and which tasks are not seen as important. By ranking their own competency, teachers gave insight to researcher as to where they may need training or support. Low competency scores in a task could illustrate a shortcoming in teacher training, or a lack of support from state FFA staff. By evaluating

importance and competence, research could be conducted ranging from teacher attrition, teacher training, and student achievement. Any high importance score with a low competency score would reflect in an area where a teacher either needs training or support. A low importance score coupled with a high competency score would illustrate an area where too much training or time involved has occurred. The needs assessment model was intended to measure the level of competence of individuals who were trained for a specific task, but the model can be modified or adapted to meet many needs of educational institutions. Borich (1980) stated, "The needs assessment model yields more data, and more understandable data, than many other types of follow-up questionnaires" (p. 42).

Data Analysis

This study utilized many different analysis procedures to appropriately use the data collected from the questionnaire to reach the study's research objectives. Each objective of this study was analyzed and reported according to the type of data recorded. Objective one was analyzed and reported using frequencies, percentages, means, and standard deviations as appropriate to report the data. Objective two was analyzed and reported using frequencies, percentages, means and standard deviations. Objective three was analyzed and reported using frequencies, percentages, means and standard deviation. Objective four was analyzed and reported using frequencies, percentages, means, standard deviation and mean weighted discrepancy scores. Objective five was analyzed and reported by calculating the mean weighted discrepancy scores, and using the non-parametric Kruskal-Wallis measure of variance.

The analysis of the tasks within each component of the three-component model included the mean weighted discrepancy scores (MWDS). This statistical procedure allowed the researcher to evaluate the differences and discrepancies within the tasks of the three-component

model. The MWDS for each response to a task allowed the research to evaluate each task to identify areas where there are discrepancies and areas for improvement. MWDS are calculated by subtracting the level of competence score from the importance score. This figure is then multiplied by the mean score for importance for each level of competency (Borich, 1980). These scores displayed in a variety of tables allows the researcher to rank tasks by their MWDS. The order of the tasks can be used to draw attention to the highest levels of discrepancy between participant's level of importance and their competency in that task (Duncan, Ricketts, Peake, & Uesseler, 2006). These lists can be used to evaluate the tasks associated with the three-component model to ensure that teacher training and education are meeting the needs of teachers. This can help stakeholders design professional learning opportunities, evaluate evaluation criteria, and help in training state staff to assist teachers. The Borich Needs Assessment model used in conjunction with MWDS is an accurate method of identifying the professional development needs of teachers (Layfield & Dobbins, 2002). This method of assessing the needs of agriculture teachers has been used in vast amounts of research with great success (Garton & Chung, 1997; Edwards & Briers, 1999; Garton & Chung, 1996; Dormody & Torres, 2002).

Measures of Validity and Reliability

Validity refers to the degree of which an instrument measures what it is intended to measure and the appropriate inferences that can be made using the collected data. There are two primary types of validity that was addressed in planning and evaluating this research. Firstly, content validity describes how well the instrument measures what it is intended to measure. To ensure content validity much care was taken to select tasks that fit in only component of the three-component model. Face validity refers to the extent to which an instrument appears to measure the intended variables (Ravid, 2011). Faculty at Auburn University served as experts to

ensure the instrument carried content and face validity. Minor changes were made to the instrument after its review except for formatting aspects on Qualtrics to make it more user friendly.

Reliability is the ability of an instrument to provide consistent results. If reliable, an instrument can be used multiple times, and the instrument will achieve similar results. Consistent measures allow others to conduct research to progress previous research for the betterment of the field. A reliable instrument will repeatedly obtain the same results if used consistently. Measures of internal consistency were used to assess reliability. These tests were based upon the assumption that responses by a participant will be consistent when asked a similar question through the instrument. Cronback's Alpha Coefficient was used as an estimate of internal consistency of the instrument. This indicates how well items and variables that measure a similar trait or concept correlate with one another and results in reliable conclusions (Ary, Jacobs, & Sorenson, 2010; Ravid, 2011). Cronbach's Alpha ranges from 0 to 1, and results closer to 1 provide greater internal consistency, and .7 is generally thought to be an acceptable level of reliability (Gliem & Gliem, 2003).

Chapter Summary

Chapter 3 highlighted the methods used in this study. Research design, population and sample, instrumentation, and data collection were all detailed throughout the chapter. Validity and reliability were evaluated by the researcher. Drawn from a sample of the population of Georgia's agriculture education teachers, data was collected through Qualtrics. Once gathered, data was statistically evaluated through a number of statistical tests. Data was compared to illustrate teacher's feelings of importance and competency of tasks separated to represent the three-component of agriculture education. Teachers were surveyed to find their thoughts on the

different components. Teachers were asked to record their favorite component to work in while recording the percentages they actually spend working in each component. That data could be evaluated against the teacher's thoughts of the percentages of time they would spend in each component in an ideal situation. Finally, mean weight discrepancy scores were calculated to find where there is the greatest difference between importance and competence. Agriculture education teachers were then split among years of experience to find if there were any differences between mean weight discrepancy scores among the groups. Through this non-experimental, quantitative research, this study serves as a vessel to investigate the thoughts of agriculture teacher's feeling of the three-component model.

CHAPTER 4
FINDINGS

This chapter presents the findings of the study after the data was analyzed. The data was guided by the research questions. To analyze the data, SPSS was used to report the findings from the responses. The findings presented in this chapter are based upon the research questions and objectives that guided the study.

1. Describe the personal characteristics of agriculture education teachers in the State of Georgia;
2. Describe the perceived importance of tasks and the perceived level of competence associated with the three-component model of agriculture education by teachers;
3. Describe agriculture teacher's perceptions on how time spent classroom activities, FFA activities, and SAE activities help serve their program;
4. Describe if agriculture education teacher's thoughts of the three-components change over time;
5. Determine the mean weighted discrepancy score by the teacher's perception of importance of each component and the teacher's perception of competence in each component;
6. Describe mean weighted discrepancy scores by teacher's level of experience;

Objective One: Describe the personal characteristics of agriculture education teachers in Georgia.

Demographic information for the respondents to this study is presented in Table 1. Of the 101 invitations to participate, 83 (82.18%) teachers responded. Male teachers represented the majority of respondents (*f*= 58, %= 69.88) while females represented 30.12% (*f*= 25). Teachers were asked to report their years of experience teaching agriculture education. The largest group responding was teachers with less with five years of experience (*f*=22, 26.51%). Other groups responding were 6-10 years of experience (*f*=12, 14.46%*)*, 11-15 years of experience (*f*=15, 18.07%), 16-20 years of experience (*f*=17, 20.48%), 21-25 years of experience (*f*=6, 7.23%), and greater than 25 years of experience (*f*=11, 13.25%). To represent the diversity of agriculture in the State of Georgia, invitations to participate were sent to teachers in all 3 of Georgia's Agriculture Education regions. The questionnaire was answered by teachers from the Central Region (*f*=41, 49.40%), North Region (*f*=20, 24.10%), and the South Region (*f*=22, 26.50%).

Table 1

Demographic Characteristics of Georgia's Agriculture Teachers

		f	%
Gender:	Male	58	69.88
	Female	25	30.12
Teaching Experience:	5 years or less	22	26.50
	6-10 years	12	14.45
	11-15 years	15	18.07
	16-20 years	17	20.48
	20-25 years	6	7.23
	26 years or more	11	13.25
Ag. Ed. Region:	North	20	24.10
	Central	41	49.40
	South	22	26.51

Note. N=83

Objective Two: Describe the perceived importance of tasks and the teacher's perceived competency associated with the three-component model of agriculture education by teachers.

Teachers were asked to rate 38 tasks using a semantic differential scale to describe in the methods section based upon Borich's Needs Assessment Model. The 38 tasks were organized into groups representing classroom instruction (12), FFA activities (13), and SAE supervision (13). Each of the three components were evaluated independently to assess each component. As reported in Table 2, the top three tasks of classroom instruction in regards to perceived importance were "Providing a classroom that is conducive for learning" (*M*=4.70, *SD*=.50), "Including leadership skills in lessons" (*M*=4.45, *SD*=.63), and "Including problem solving lessons" (*M*=4.41, *SD*=.68). The tasks illustrating the least importance were "Having daily lesson plans" (*M*=3.65, *SD*=1.13) and "Grouping students by ability level" (*M*=3.77, *SD*=.85). The tasks where teachers self-reported the highest competency scores were "Having a classroom that is conducive for learning" (*M*=4.37, *SD*=.60), "Including leadership skills in lessons" (*M*=4.18, *SD*=.60), and "Designing curriculum in advance of teaching" (*M*=4.14, *SD*=.64). The tasks associated with classroom instruction that illustrated the lowest perceived competence were "Planning remediation for struggling students" (*M*=3.73, *SD*=.70) and "Grouping students by ability level" (*M*=3.85, *SD*=.65).

Table 2

Importance and Competency Ratings of Teacher Tasks Associated with Classroom Instruction by Georgia's Agriculture Teachers.

Task	Importance		Competency	
	M	*SD*	*M*	*SD*
Providing a classroom that is conducive for learning	4.70	.49	4.37	.60
Including leadership skills in lessons	4.45	.63	4.18	.65
Including problem solving lessons	4.41	.68	4.04	.68
Differentiating processes and projects to meet student's needs	4.22	.75	3.94	.73
Planning remediation for struggling students	4.14	.75	3.73	.70
Designing curriculum in advance of teaching	4.12	.84	4.14	.67
Including record keeping in lessons	4.01	.78	3.85	.67
Grading work in a timely manner	3.94	.74	3.95	.73
Including the use of technology in lessons	3.80	.79	3.90	.75
Using assessments to guide instruction	3.78	.74	3.94	.65
Grouping students by ability level	3.77	.85	3.85	.65
Having daily lesson plans	3.65	1.13	4.13	.64

Note. Importance was measured from 1 to 5 (1 = not important, 2 = of little importance, 3 = somewhat important, 4 = important, and 5= very important). Competency was measured from 1 to 5 (1 = not competent, 2 = little competence, 3 = somewhat competence, 4 = competent, and 5 = very competent).

Table 3 reflects Georgia's agriculture education teacher's feelings of importance and competency in tasks the teacher is responsible for in FFA activities. In ranking the tasks associated with operating an FFA program, the teachers surveyed rated "Promoting you FFA chapter to students" (*M*=4.80, *SD*=.43), "Promoting your FFA chapter to your administration" (*M*=4.80, *SD*=.43), and "Promoting your FFA chapter to your community" (*M*=4.76, *SD*=.53)

as the most important tasks involved in FFA activities. The activities rated as the least important were "Having a working FFA constitution" (*M*=3.71, *SD*=.95) and "Having a set of chapter bylaws" (*M*=3.77, *SD*=.95). Teachers reported the most competence in "Planning a chapter banquet" (*M*=4.41, *SD*=.64), "Controlling a chapter budget" *(M*=4.34, SD=.63), and "Promoting your FFA chapter to your administration" (*M=4.30,* SD=.60). Teachers reported the least perceived competence in "Having a working FFA constitution" (*M*=3.75, *SD*=.74) and "Having a set of chapter bylaws" (*M*=3.76, *SD*=.64).

Table 3

Importance and Competency Ratings of Teacher Tasks Associated with FFA Activities by Georgia's Agriculture Teachers.

Task	Importance		Competency	
	M	*SD*	*M*	*SD*
Training competitive CDE teams	4.32	.68	4.09	.69
Planning productive FFA meetings	4.33	.59	3.99	.63
Having a working FFA constitution	3.71	.95	3.75	.74
Having a set of chapter bylaws	3.77	.95	3.76	.64
Planning a chapter banquet	4.61	.62	4.41	.64
Promoting your FFA chapter to students	4.80	.43	4.23	.65
Promoting your FFA chapter to your administration	4.80	.43	4.30	.60
Promoting your FFA chapter to your community	4.76	.53	4.10	.67
Recruiting students to your FFA program	4.73	.50	4.14	.73
Completing community service projects	4.46	.67	4.14	.67
Electing quality officers	4.73	.47	4.17	.62
Having an accurate Program of Activities for you FFA chapter	4.46	.61	4.12	.68
Controlling a chapter budget	4.57	.65	4.34	.63

Note. Importance was measured from 1 to 5 (1 = not important, 2 = of little importance, 3 = somewhat important, 4 = important, and 5= very important). Competency was measured from 1 to 5 (1 = not competent, 2 = little competence, 3 = somewhat competence, 4 = competent, and 5 = very competent).

Table 4 represents the responses from Georgia's agriculture education teachers about their perceived importance and competency in tasks associated with the teacher's responsibilities during SAE supervision. Teachers illustrated the most important tasks were "Students being able to show growth in their SAEs" (*M*=4.38, *SD*=.64), "Actively supervising student's SAEs" (*M*=4.28, *SD*=.63), and "Assessing the records of student's SAEs" (*M*=4.26, *SD*=.68). The least important factors reported by teachers were "Supervising research/ agriscience SAEs" (*M*=3.90, *SD*=.82) and "Having students complete proficiency awards applications" (*M*=3.94, *SD*=1.00). Teachers reported the highest competency scores in "Supervising livestock SAEs" (*M*=4.18, *SD*=.73), "Actively supervising student's SAEs" (*M*=4.00, *SD*=.73), and "Students being able to show growth in their SAEs" (*M*=3.99, *SD*=.67). The tasks that recorded the lowest competency scores were "Supervising research/ agriscience SAEs" (*M*=3.67, *SD*=.70) and "Helping students find job shadowing experiences for their SAEs" (*M*=3.76, *SD*=.74).

Table 4

Importance and Competency Ratings of Teacher Tasks Associated with SAE supervision by Georgia's Agriculture Teachers.

Task	Importance		Competency	
	M	*SD*	*M*	*SD*
Designing SAE programs that fit the needs of your community	4.10	.76	3.87	.66
Actively supervising student's SAEs	4.28	.63	4.00	.73
Using common record keeping systems	4.16	.64	3.90	.73
Supervising livestock SAEs	4.13	.81	4.18	.73
Supervising agricultural mechanics SAEs	3.98	.74	3.80	.71
Supervising research/ agriscience SAEs	3.90	.82	3.67	.70
Including financial information in SAEs	4.09	.74	3.83	.70
Assessing the records of student's SAEs	4.26	.68	3.99	.72
Creating a timeline for the completion of SAEs	4.13	.80	3.93	.73
Students being able to show growth in their SAEs	4.38	.64	3.99	.67
Helping students find job shadowing experiences for their SAEs	4.07	.86	3.76	.74
Helping students with Work Based Learning options for their SAEs	4.07	.86	3.84	.71

Having students complete proficiency awards applications	3.94	1.00	3.89	.77

Note. Importance was measured from 1 to 5 (1 = not important, 2 = of little importance, 3 = somewhat important, 4 = important, and 5= very important). Competency was measured from 1 to 5 (1 = not competent, 2 = little competence, 3 = somewhat competence, 4 = competent, and 5 = very competent).

After evaluating the scores from teacher responds by separating the components of the three-component model, it is important to evaluate the data as a whole. Table 5 represents all the components rated together. All of the top five tasks ranked by importance belong in the FFA activities portion of the study. "Promoting your FFA program to students" (*M*=4.80, *SD*=.43), "Promoting your FFA program to your administration" (*M*=4.80, *SD*=.43), "Promoting you FFA program to your community" (*M*=4.67, *SD*=.53), "Recruiting students to your FFA program" (*M*=4.73, *SD*=.50), and "Electing quality officers" (*M*=4.73, *SD*=.47) were the highest scoring tasks reported on importance. The lowest ranking tasks regarding importance came from all three categories. "Having daily lesson plans" was the least important task from the respondents (*M*=3.65, *SD*=1.13). The remaining four with the lowest importance scores where "Having a working FFA constitution" (*M*=3.71, *SD*=.95), "Having a set of chapter bylaws" (*M*=3.77, *SD*=.95), Grouping students by ability level" (*M*=3.77, *SD*=.85), and "Using assessment to guide instruction" (*M*=3.78, *SD*=.74).

Georgia's agriculture education teachers showed high and low self-reported competency through all three components of the three-component model. Teachers reported the highest competency in the tasks of "Planning a chapter FFA banquet" (*M*=4.41, *SD*=.64), "Providing a classroom that is conducive for learning" (*M*=4.37, *SD*=.60), "Controlling a chapter budget" (*M*=4.34, *SD*=.63), "Promoting your FFA chapter to your administration" (*M*=4.30, *SD*=.60),

and "Promoting your FFA chapter to students" (*M*=4.23, *SD*=.65). The lowest competencies illustrated by Georgia's agriculture teachers were "Supervising research/ agriscience SAEs" (*M*=3.67, *SD*=.70), "Planning remediation for struggling students" (*M*=3.73, *SD*=.70), "Having a working FFA constitution" (*M*=3.76, *SD*=.74), "Helping students find job shadowing opportunities for their SAE" (*M*=3.76, *SD*=.70), and "Having a set of chapter bylaws" (*M*=3.76, *SD*=.69).

Table 5

Importance and Competency Ratings of Teacher Tasks within the Three-Component Model of Agriculture Education by Georgia's Agriculture Education Teachers.

Component	Task	Importance		Competence	
		M	*SD*	*M*	*SD*
Classroom Instruction	Having daily lesson plans	3.65	1.13	4.13	.64
	Designing curriculum in advance of teaching	4.12	.84	4.14	.67
	Grading work in a timely manner	3.94	.74	3.95	.73
	Using assessment to guide instruction	3.78	.74	3.94	.65
	Differentiating processes and projects to meet student's needs	4.22	.75	3.94	.73
	Including problem solving lessons	4.41	.68	4.05	.68
	Including leadership skills in lessons	4.45	.63	4.18	.65
	Including record keeping in lessons	4.01	.78	3.85	.67
	Including the use of technology in lessons	3.80	.79	3.90	.75
	Planning remediation for struggling students	4.14	.75	3.73	.70
	Grouping students by ability level	3.77	.85	3.85	.65
	Providing a classroom that is conducive for learning	4.70	.49	4.37	.60
FFA Activities	Training competitive CDE teams	4.32	.68	4.09	.69
	Planning productive FFA meetings	4.33	.59	3.99	.63
	Having a working FFA constitution	3.71	.95	3.75	.74
	Having a set of chapter bylaws	3.77	.95	3.76	.69

	Planning a chapter banquet	4.61	.62	4.41	.64
	Promoting your FFA chapter to students	4.80	.43	4.23	.65
	Promoting your FFA chapter to your administration	4.80	.43	4.3	.60
	Promoting your FFA chapter to your community	4.76	.53	4.10	.67
	Recruiting students to your FFA program	4.73	.50	4.14	.73
	Completing community service projects	4.46	.67	4.14	.67
	Electing quality officers	4.73	.47	4.17	.62
	Having an accurate Program of Activities for your FFA chapter	4.46	.67	4.12	.68
	Controlling a chapter budget	4.57	.65	4.34	.63
	Students being able to show growth in their SAEs	4.38	.64	3.99	.67
	Actively supervising student's SAEs	4.28	.63	4.00	.73
	Assessing the records of student's SAEs	4.26	.68	3.99	.72
	Using common record keeping systems	4.16	.64	3.90	.73
	Supervising livestock SAEs	4.13	.81	4.18	.73
	Creating a timeline for the completion of SAEs	4.13	.80	3.93	.73
	Designing SAE programs that fit the needs of your community	4.10	.76	3.87	.66
SAE Supervision	Including financial information in SAEs	4.09	.74	3.83	.70
	Helping students find job shadowing experiences for their SAEs	4.07	.86	3.76	.74
	Helping students with Work Based Learning options for their SAEs	4.07	.86	3.84	.71
	Supervising agricultural mechanics SAEs	3.98	.74	3.80	.71
	Having students complete proficiency awards applications	3.94	1.00	3.89	.77
	Supervising research/ agriscience SAEs	3.90	.82	3.67	.70

Note. Importance was measured from 1 to 5 (1 = not important, 2 = of little importance, 3 = somewhat important, 4 = important, and 5= very important). Competency was measured from 1

to 5 (1 = not competent, 2 = little competence, 3 = somewhat competence, 4 = competent, and 5 = very competent).

By reporting the components as a group and evaluating the overall, or grand, mean across the entire section we are able to see in which component Georgia's agriculture teachers rate their importance and competence as a group. In importance, Georgia's agriculture education teachers found the FFA activities were the most important component (*M*=4.47, *SD*=.32). SAE supervision was ranked second (*M*=4.11, *SD*.14), and classroom instruction ranked third (*M*=4.08, *SD*=.32). When rating competency scores, Georgia's agriculture education teachers ranked FFA activities as the area where they self-reported the highest (*M*=4.18, *SD*=.20), classroom instruction was ranked second (*M*=4.00, *SD*=.18), and SAE supervision had the lowest total competency score (*M*=3.90, *SD*=.13).

Table 6

Grand Mean Scores for Importance and Competency Ratings of the Three-Component Model by Georgia's Agriculture Education Teachers

Component	Importance		Competence	
	M	*SD*	*M*	*SD*
Classroom Instruction	4.08	.32	4.00	.18
FFA Activities	4.47	.36	4.18	.20
SAE Supervision	4.11	.14	3.90	.13

Note. Importance was measured from 1 to 5 (1 = not important, 2 = of little importance, 3 = somewhat important, 4 = important, and 5= very important). Competency was measured from 1 to 5 (1 = not competent, 2 = little competence, 3 = somewhat competence, 4 = competent, and 5 = very competent).

Objective 3: Describe agriculture teacher's perceptions on how time spent in classroom instruction, FFA activities, and SAE supervision help serve their program.

To start the questionnaire, teachers were asked to report their favorite component of the three-component model to spend their time working in. This question served two purposes, it was used to record the data from the question, and it familiarized the teacher with the questionnaire and how it worked. As reported in Table 7 the majority of teachers responded that they enjoyed their time working in classroom instruction (*f*=44, %=53.01). FFA activities (*f*=23, *%*=27.71), and SAE supervision (*f*=16, *%*=19.23) followed.

Table 7

Georgia Agriculture Education Teacher's Favorite Component to Work in.

Component	*f*	%
Classroom Instruction	44	53.01
FFA Activities	23	27.71
SAE Supervision	16	19.23

Note. N=83

Georgia's agriculture teachers were also questioned on the actual amount of time (Table 8) spent in each component of the three-component model and the teacher's thoughts about the ideal time (Table 9) spent in each component. This information allows to research to investigate the differences in teacher preferences, actual time, and the ideal times spent in each component. The differences in the scores (Table 10) will illustrate the teacher's feelings of spending too much time in a component (a negative number), spending the right amount of time in a component (a number close to 0), and not spending enough time in a component (a positive number).

When the teachers were asked to report their actual time spent in each component, they were asked to record the percentage of time they spent during their working hours. Teachers

reported spending the most time in classroom instruction (*M*=44.00, *SD*=13.20). FFA activities (*M*=31.60, *SD*=8.36) and SAE supervision (*M*=24.40, *SD*=10.57) followed.

Table 8

Georgia Agriculture Education Teacher's Actual Self Reported Time in each Component of the Three Component Model.

Component	*M*	*SD*
Classroom Instruction	44.00	13.20
FFA Activities	31.60	8.36
SAE Supervision	24.40	10.57

Note. N=83

Teachers were asked to report their ideal percentage of time spent in each component of the three-component model. Teachers reported that their ideal time spent in each component would consist mostly of classroom instruction (*M*=40.24, *SD*=11.73), followed by FFA activities (*M*=30.75, *SD*=7.06), and ending with SAE supervision (*M*=29.01, *SD*=7.19).

Table 9

Georgia Agriculture Education Teacher's Ideal Amount of Time spent Working in each Component of the Three-Component Model.

Component	*M*	*SD*
Classroom Instruction	40.24	11.73
FFA Activities	30.75	7.06
SAE Supervision	29.01	7.19

Note. N=83

To investigate the differences between teacher's ideal focus and their actual focus, the research found the difference between the two (ideal score – actual score) (Table 10). These differences would illustrate if a teacher perceived themselves spending too much time in a component (a negative number), the right amount of time on a component (a value close to zero), or not enough time on a component (a positive number).

Table 10

The difference (Ideal focus- Actual focus) of the focus of the Three Component Model of Georgia's Agriculture Education Teacher's Programs

Component	Difference (Ideal focus vs Actual time)
Classroom Instruction	-3.76
FFA Activities	-.85
SAE Supervision	4.61

Note. These figures indicate the average ideal focus among components subtracted by the average of the actual focus of Georgia's agriculture education teachers.

Objective 4: Describe if agriculture education teacher's thoughts of the three-components change over time

The thoughts, needs, and goals of agriculture education teachers change over time, and to accomplish the objectives of this study the changes in views of three-component model needed to be investigated. To accurately determine if the perceived difference in the amount of time actually spent in each component versus the ideal time spent in each component changed over time the respondents were grouped by their years of teaching. Respondents were grouped into less than 5 years teaching experience (N=22), 6-10 years of teaching experience (N=12), 11-15 years of teaching experience (N=15), 16-20 years of teaching experience (N=17), and more than 20 years of teaching experience (N=17). The difference between groups were then evaluated to determine if changes develop as a teacher matures.

All groups reported that they spent too much time on classroom instruction (Table 11). Teachers with 6-10 years of teaching experience responded the strongest (M=-5.17, SD=7.31).

Teachers with 11-15 years of teaching experience were the happiest with the amount of time spent in classroom instruction (*M*=-1.47, *SD*=13.18).

Table 11

The Difference (Ideal Focus- Actual Focus) in the Focus of Georgia's Agriculture Education Teachers of Classroom Instruction.

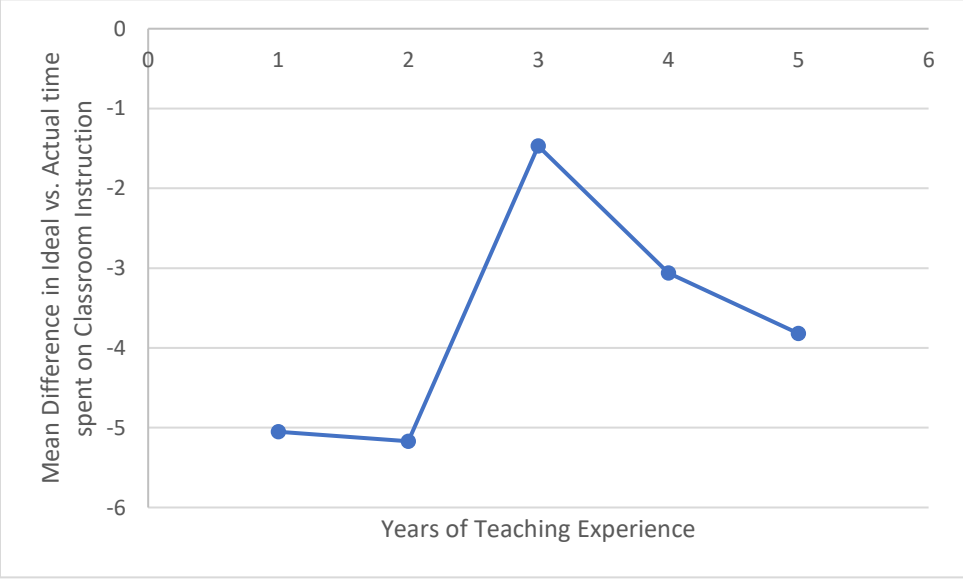
Years of Teaching Experience	*N*	*M*	*SD*
Less than 5 Years	22	-5.05	11.73
6-10 Years	12	-5.17	7.31
11-15 Years	15	-1.47	13.18
16-20 Years	17	-3.06	11.92
More than 20 Years	17	-3.82	11.56

Note. N=83. *M*= the mean of the difference of ideal focus versus actual focus of each group of teaching experience.

Represented graphically two inquiries are reinforced. The teachers surveyed reported they are spending more time on classroom instruction than would be ideal, and that feeling changes over time. All groups feel they are spending more time than ideal illustrated by all values being less than zero.

Figure 4.

The difference in ideal focus and actual focus over years of service in classroom instruction.



Groups of teaching experience did all not agree on FFA activities. Some groups felt they were spending too much time on FFA activities. Teachers with less than 5 years teaching experience (*M*=-1.41, *SD*=8.79), teachers with 11-15 years of teaching experience (*M*=-1.60, *SD*=7.04), and teachers with 16-20 years of teaching experience (*M*=-2.47, *SD* = 9.81). Teachers with 6-10 years of teaching experience (*M*=1.25, *SD*=8.81) reported that they spent too little time on FFA activities. Teachers with more than 20 years of experience (*M*=.65, *SD*=8.52) reported their time spent on FFA activities was very close to their ideal time.

Table 12

The difference (Ideal Focus – Actual Focus) of the Focus of Georgia's Agriculture Education Teachers of FFA Activities.

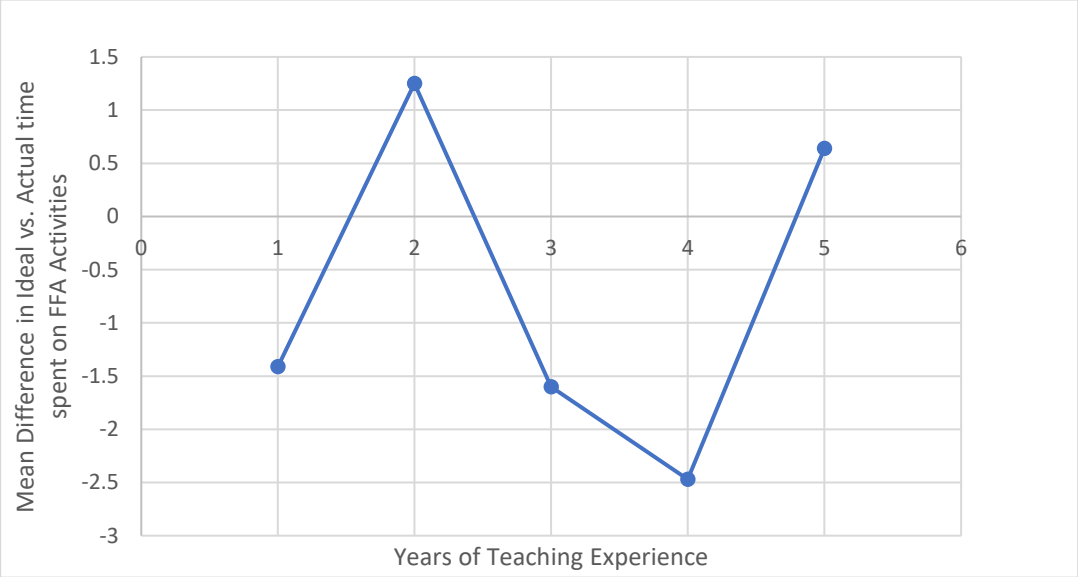
Years of Teaching Experience	*n*	*M*	*SD*
Less than 5 Years	22	-1.41	8.79
6-10 Years	12	1.25	8.81
11-15 Years	15	-1.60	7.04
16-20 Years	17	-2.47	9.81
More than 20 Years	17	.65	8.52

Note. N=83. *M*= the mean of the difference of ideal focus versus actual focus of each group of teaching experience.

When represented graphically the study illustrates that some teachers feel they spend more time than ideal while others spend less time than ideal on FFA activities. Values greater than zero illustrates a teacher who is spending less actual time on a component than they think is ideal. Values less than zero indicate the teacher is spending more time on a component than they feel as ideal.

Figure 5.

The difference between ideal focus and actual focus over years of service for FFA activities



Teachers with less than 5 years of teaching experience illustrated the greatest difference between actual time spent on SAE supervision and their ideal time spent on SAE supervision (*M*=6.15, *SD*=9.60). Teachers with 11-15 years of experience illustrated the smallest difference between ideal time and actual time (*M*=3.07, *SD*=9.26).

Table 13

The difference (Ideal Focus – Actual Focus) of the Focus of Georgia's Agriculture Education Teachers of SAE Supervision.

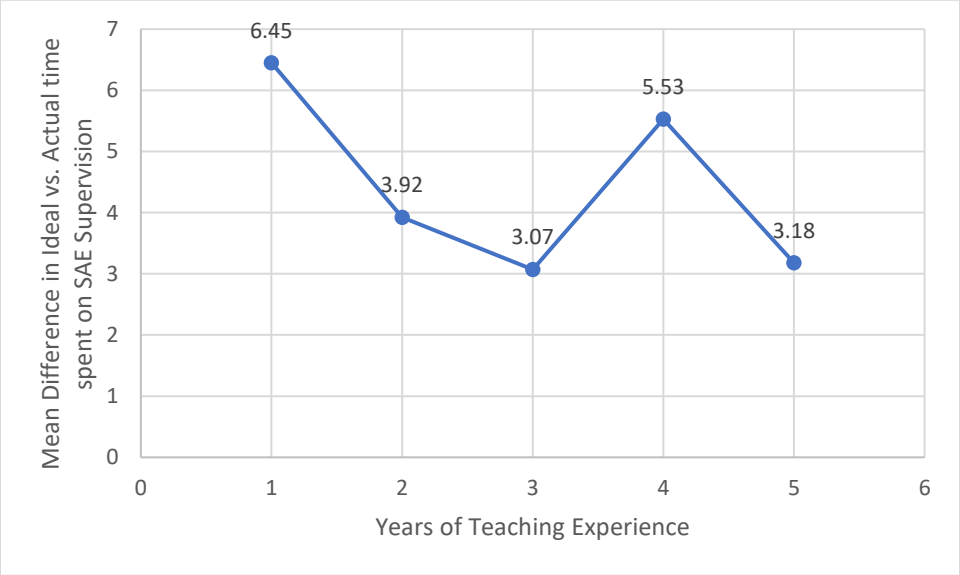
Years of Teaching Experience	*N*	*M*	*SD*
Less than 5 Years	22	6.45	9.60
6-10 Years	12	3.92	11.25
11-15 Years	15	3.07	9.26
16-20 Years	17	5.53	7.35
More than 20 Years	17	3.18	9.76

Note. N=83. *M*= the mean of the difference of ideal focus versus actual focus of each group of teaching experience.

The result of all groups feeling they spend less time than ideal on SAE supervision is represented in Figure 9. All values are greater than zero illustrating that all groups feel they are spending less actual time than they feel is ideal. The greater the number, the greater the disparity.

Figure 6.

The difference between ideal focus and actual focus over years of service in SAE supervision.



To investigate if the difference in ideal time and actual time changes as teachers gain experience this study used a pairwise comparison across age groups to find if any of the groups illustrated a difference from other groups (Table 14). Teachers with less than 5 years of teaching experience was significantly different from teachers with 11-15 years of teaching experience (t=18.96, p=.02) and teachers with 16-20 years of teaching experience (t=23.19, p=.003). All other group's distributions were the same.

Table 14

Pairwise Comparison of the Ideal Focus – Actual Focus Along Years of Teaching Experience

Comparison of Groups	Test Statistic	Sig.
4-1	23.19	.01
3-1	18.96	.02
2-1	15.53	.07
4-5	-13.71	.10
5-1	9.48	.22
3-5	-9.84	.27
4-2	7.66	.40
2-5	-6.05	.51
4-3	4.22	.62
3-2	3.43	.71

Note. 1 = less than five years of experience, 2 = 6-10 years of experience, 3 = 11-15 years of experience, 4 = 16-20 years if experience, and 5 = more than 20 years of experience.

Objective 5: Determine the mean weighted discrepancy score by the teacher's perception of importance of each component and the teacher's perception of competence in each component.

When the respondents self reported their scores for a task's level of importance and their perceived competency in that task, this study can investigate for differences between the two. This difference is represented by the mean weighted discrepancy score (MWDS). This productive figure can guide help researchers to find where there are high levels of importance and low levels of competency. This would be an area where teachers need support, training, or professional learning.

In classroom instruction (Table 15), the tasks receiving the highest discrepancy scores were "Planning remediation for struggling students" (MWDS = 1.63), "Including problem solving lessons" (MWDS = 1.58), and "Providing a classroom that is conducive for learning" (MWDS = 1.50). The tasks ranked with the lowest discrepancy scores were "Having daily

lesson plans" (MWDS = -1.73), "Using assessment to guide instruction" (MWDS = -.61), and "Including the use of technology in lessons" (MWDS = -.38).

Table 15

Mean Weighted Discrepancy Scores for Tasks associated with Classroom Instruction.

Classroom instruction task	MWDS
Planning remediation for struggling students	1.63
Including problem solving lessons	1.58
Providing a classroom that is conducive for learning	1.50
Including leadership skills in lessons	1.21
Differentiating processes and projects to meet student's needs	1.15
Including record keeping in lessons	.54
Designing curriculum in advance of teaching	-.05
Grading work in a timely manner	-.10
Grouping students by ability level	-.37
Including the use of technology in lessons	-.38
Using assessment to guide instruction	-.61
Having daily lesson plans	-1.73

Note. MWDS = Mean Weighted Discrepancy Score

Teacher's discrepancy scores for tasks associated with FFA activities are reported in Table 16. The highest discrepancy scores reported for FFA activities were "Planning productive FFA meetings" (MWDS = 4.16), "Promoting your FFA chapter to your community" (MWDS = 3.09), and "Recruiting students to your FFA program" (MWDS = 2.74). The lowest discrepancy scores were "Having a working FFA constitution" (MWDS = -.13), "Having a set of chapter bylaws" (MWDS = .09), and "Planning a chapter banquet" (MWDS = .89).

Table 16

Mean Weighted Discrepancy Scores for Tasks Associated with FFA Activities

FFA activities task	MWDS
Planning productive FFA meetings	4.16
Promoting your FFA chapter to your community	3.09
Recruiting students to your FFA program	2.74
Promoting your FFA chapter to your administration	2.73
Promoting your FFA chapter to students	2.72
Electing quality officers	2.62
Having an accurate Program of Activities for your FFA chapter	1.60

Completing community service projects	1.40
Controlling a chapter budget	1.05
Training competitive CDE teams	.99
Planning a chapter banquet	.89
Having a set of chapter bylaws	.09
Having a working FFA constitution	-.13

Note. MWDS = Mean Weighted Discrepancy Score

For SAE supervision (Table 17), the highest discrepancy scores reported were "Students being able to show growth in their SAEs" (MWDS = 1.64), "Helping students find job shadowing experiences for their SAEs" (MWDS = 1.23), and "Actively supervising student's SAE" (MWDS = 1.24). The lowest discrepancy scores were "Supervising livestock SAEs" (MWDS = -.15), "Having students complete proficiency awards applications: (MWDS = .14), and "Supervising agricultural mechanics SAEs" (MWDS = .72).

Table 17

Mean Weighted Discrepancy Score for Tasks Associated with SAE Supervision

SAE supervision task	MWDS
Students being able to show growth in their SAEs	1.64
Helping students find job shadowing experiences for their SAEs	1.23
Actively supervising student's SAE	1.14
Assessing the records of student's SAEs	1.08
Using common record keeping systems	1.00
Including financial information in SAEs	.98
Designing SAE programs that fit the needs of your community	.89
Helping students with Work Based Learning options for their SAEs	.88
Supervising research/ agriscience SAEs	.80
Creating a timeline for the completion of SAEs	.80
Supervising agricultural mechanics SAEs	.72
Having students complete proficiency awards applications	.14
Supervising livestock SAEs	-.15

Note. MWDS = Mean Weighted Discrepancy Score

By comparing all tasks together, this study can attempt to explain where teachers feel they have a task that is highly important and they have little competence. Comparing all tasks and discrepancy scores the data illustrates that the highest 6 scores come from the FFA activities

section. "Planning productive FFA meetings" (MWDS = 4.16), "Promoting your FFA chapter to your community" (MWDS = 3.09), "Recruiting students to your FFA program" (MWDS = 2.74), "Promoting your FFA chapter to your administration" (MWDS = 2.73), and "Promoting you FFA chapter to students" (MWDS = 2.72). The lowest four discrepancy scores come from the classroom instruction section. "Having daily lesson plans" (MWDS = -1.73), "Using assessment to guide instruction" (MWDS = -.61), "Including the use of technology in lessons" (MWDS =-.38), and "Grouping students by ability level" (MWDS = -.37) were the lowest scoring tasks overall.

Table 18

Mean Weighted Discrepancy Score for all Tasks Associated with the Three-Component Model of Agriculture Education

Task	MWDS
Planning productive FFA meetings	4.16
Promoting your FFA chapter to your community	3.09
Recruiting students to your FFA program	2.74
Promoting your FFA chapter to your administration	2.73
Promoting your FFA chapter to students	2.72
Electing quality officers	2.62
Students being able to show growth in their SAEs	1.64
Planning remediation for struggling students	1.63
Having an accurate Program of activities for your FFA chapter	1.60
Including problem solving lessons	1.58
Providing a classroom that is conducive for learning	1.51
Planning productive FFA meetings	1.46
Completing community service projects	1.40
Helping students find job shadowing experiences for their SAEs	1.23
Including leadership skills in lessons	1.21
Differentiating processes and projects to meet student's needs	1.15
Actively supervising student's SAEs	1.14
Assessing the records of student's SAEs	1.08
Controlling a chapter budget	1.05
Using common record keeping systems	1.00
Training competitive CDE teams	.99
Including financial information of SAEs	.98
Planning a chapter banquet	.89
Designing SAE programs that fit the needs of your community	.89

Helping students with Work Based Learning options for their SAEs	.88
Supervising research/ agriscience SAEs	.80
Creating a timeline for the completion of SAEs	.80
Supervising agricultural mechanics SAEs	.72
Including record keeping in lessons	.54
Having students complete proficiency award applications	.14
Having a set of chapter bylaws	.09
Designing curriculum in advance of teaching	-.05
Grading work in a timely manner	-.10
Having a working FFA constitution	-.13
Supervising livestock SAEs	-.15
Grouping students by ability level	-.37
Including the use of technology in lessons	-.38
Using assessment to guide instruction	-.61
Having daily lesson plans	-1.73

Note. MWDS = Mean Weighted Discrepancy Score

By investigating the means of the discrepancy scores from each component of the three-component model of agriculture education (Table 19), this study can observe that FFA activities had the greatest discrepancy scores (M=1.60, SD=2.12). SAE supervision (M=.86, SD=1.84) and classroom instruction (M=.38, SD=1.74) followed.

Table 19

The Means of the Mean Weighted Discrepancy Score for Each Component of the Three-Component Model of Agriculture Education

Component	*M*	*SD*
Classroom Instruction	.38	1.74
FFA Activities	1.60	2.12
SAE Supervision	.86	1.59

To determine if MWDS of individuals changed over time the study grouped teachers again by years of teaching experience. The study used the same groups (less than 5 years, 6-10 years, 11-15 years, 16-20 years, and more than 20 years) as before. To evaluate if the groups had the same distribution, this study used a Kruskal-Wallis test (Table 20). The non-parametric Kruskal-Wallis test was used because of the lack of linearity of the data due to small size of each group. Only SAE supervision was significantly different across age groups $H4$=10.80, p=.03.

Table 20

Results from the Kruskal-Wallis Test Testing if the Distribution of Each Average MWDS is the Same Across Every Group of Years of Teaching Experience

Component MWDS Average	*Sig*
Classroom Instruction	.12
FFA Activities	.16
SAE Supervision	.03***

****p* <.05

Chapter Summary

Chapter four reported the findings of this study based upon six objectives that guided the study. The research objectives for the study were: (1) Describe the personal characteristics of agriculture education teachers in the State of Georgia. (2) Describe the perceived importance of tasks and the perceived level of competence associated with the three-component model of agriculture education by teachers. (3) Describe agriculture teacher's perceptions on how time spent on classroom instruction, FFA activities, and SAE activities help serve their program. (4) Describe if agriculture education teacher's thoughts of the three-components change over time. (5) Determine the mean weighted discrepancy score by the teacher's perception of the importance of each component and the teacher's perception of competence in each component. (6) Describe mean weighted discrepancy scores by teacher's level of experience. The findings presented in this chapter provided a better understanding of Georgia's agriculture education teachers perceptions of the three-component model of agriculture education. The respondent's demographic information is recorded in Chapter 4. The findings described the perceptions of importance and competency of tasks associated with each component are recorded and ranked. The study investigated the amount of time is spent by teachers in each component and compared that to a teacher's ideal focus. Mean weighted discrepancy scores were calculated for tasks in each component, and those scores were evaluated by groups made by teaching experience. The

findings reported in chapter four are further discussed in chapter five with conclusions, discussions, and recommendations based upon the data collected for this study.

CHAPTER 5
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

The purpose of this study was to determine the perceptions of Georgia's agriculture education teachers on the three-component model of agriculture education. The three-component model is the foundation of how agriculture education is taught. Agriculture education is responsible for supplying the future workers to the agriculture industry. Agriculture will be responsible for feeding less people with less land in the future, and to achieve a victory in that task, we need the best and brightest students. For students to become well versed in agriculture, have the problem solving skills to compete in a difficult industry, and have the leadership skills to communicate their successes to society, the students will need great agriculture education programs. Agriculture education programs need leadership through a competent agriculture education teacher. At the very least, agriculture education needs to make the population more agriculturally literate. If literate, individuals can work within the agriculture industry to help feed the masses.

Every agriculture education teacher is familiar with the three-component model of agriculture education, but the Venn diagram that is represented leaves much to the imagination. The circles are equal, and it should be the goal of every agriculture education teacher to provide each student with classroom instruction, FFA activities, and SAE supervision. If all components are focused on equally, the model has no fluidity to serve the differences in communities, teachers, and students. This study attempted to describe how teachers use the three-component model to fit the needs of their program.

Summary of the Study

This study was designed to describe how the three-component model of agriculture education is followed as viewed and to investigate the perceptions of teachers of tasks associated with each component. This goals and design of this study was inspired by the work in the AAAE National Research Agenda. This study attempted to solve problems represented by research priority number five which seeks to provide students with efficient and effective agriculture education programs (Thoron, Myers, & Barrick, 2016). If the three-component model is the foundation of agriculture education, it would be an essential part of finding if agriculture education programs were efficient and effective. By investigating teacher's perceptions of the model, new strategies can be implemented to help to make more agriculture education programs more efficient and effective. Through the data compiled by this study, researchers can have a better insight into the perceptions of teachers current running Georgia's agriculture education programs. To answer the research questions helpful to achieve the goals of National Research Agenda this study's objectives were:

1. Describe the personal characteristics of agriculture education teachers in the State of Georgia;
2. Describe the perceived importance of tasks and the perceived level of competence associated with the three-component model of agriculture education by teachers;
3. Describe agriculture teacher's perceptions on how time is spent on classroom instruction, FFA activities, and SAE supervision to help serve their programs;
4. Describe if agriculture education teacher's thoughts of the three-components change over time;

5. Determine the mean weighed discrepancy score by the teacher's perception of importance of each component and the teacher's perception of competence in each component;
6. Describe mean weighted discrepancy scores by teacher's level of experience.

Although agriculture education should serve the agricultural industry, students are the end users of agriculture education. To serve the agricultural industry, agriculture education needs to train the students to have problem solving skills, be versatile, and have the skills needed to lead or follow to achieve goals. Before these students can be trained, they must be recruited. Effective programs draw effective students. Agriculture education courses need to be rigorous enough to serve high-achieving students. To aid in this recruitment, the agriculture education program must have a favorable view among the school's administration. With their help, the program can be highlighted as a place for students succeed. With student success, community support will come. Every community stands to benefit from students gaining knowledge and being career ready. An agriculture education program that has community support will have more opportunities for students to gain work experience. This path to success highlights how the three-component serves agriculture education. Students learn skills and knowledge in the classroom from a qualified agriculture education teacher. Eventually, through the hands-on aspect of agriculture education, students will have a chance to apply that skill or knowledge in a real-world application. Students should have the opportunity to learn new skills that will benefit them no matter their chosen profession through an agriculture education class. Communication, work ethic, and dependability are traits that every employer wants in a new hire. The FFA teaches many of these lessons through application and observance. At the very least, the FFA can be the one place where students feel they belong in education. The work experience through

SAE projects are an invaluable tool in preparing students to work effectively in future. This student driven exercise allows students to have a choice in their work. They will have to practice practical lessons in time management, record keeping, and build a tenacity to finish work when it gets difficult. The three-component model serves an effective foundation for agriculture education.

This quantitative non-experimental survey research design allowed this study to investigate the feelings, importance, and competence of the three-component model of agriculture education by Georgia's agriculture education teachers. A simple random sample (N=101) of the population was calculated using Cochran's (1977) sample size formula for continuous data and minimum return sample size. 83 (82.18%) teachers responded and completed the survey. Participants completed an online questionnaire used to determine their perceptions of the three-component model of agriculture education. Teachers initially recorded their perceptions of tasks associated with each component. Teachers recorded their perceived importance and their competence in that task. Teachers were then surveyed on the amount of time their program spent on each component, and they had the opportunity to record what times in each component would be ideal for them and their program. Finally, teachers recorded their demographic information. The collected data were analyzed and reported using a variety of statistical methods based upon the specific objective including frequencies, percentages, means, standard deviations, pairwise comparisons, and Kruskal-Wallis tests.

Conclusions and Discussion

The conclusions and discussion reported were based on the data collect from Georgia's agriculture education teachers when the data was analyzed and reviewed. Teacher perceptions of the three-component model provided the researcher with the following conclusions:

1. Classroom instruction has the lowest average MWDS of the components of the three-component model of agriculture education.
2. FFA activities have the highest average MWDS of the components of the three-component model of agriculture education.
3. SAE supervision has a significant difference across years of teaching groups when comparing their MWDS.
4. Georgia's agriculture education teacher's demographics represent current trends.
5. This study allowed for representation across all levels of teaching experience.
6. Georgia's agriculture education teachers perceive classroom instruction as the least important component of the three-component model of agriculture education.
7. Georgia's agriculture education teachers perceive FFA activities as the most important component of the three-component model of agriculture education.
8. Georgia's agriculture education teachers feel least competent in SAE supervision.
9. Georgia's agriculture education teachers spend most of their time in classroom instruction.
10. The perceived ideal allotment of each component by Georgia's agriculture education teachers is closer to an equal split of each component than the actual time spent on each component.

11. Georgia's agriculture education teachers perceive themselves as spending too much time on classroom instruction, about the right amount of time on FFA activities, and not enough time on SAE supervision.
12. Teachers with 11-15 years of teaching experience perceive themselves to have the lowest difference between the ideal time spent on classroom instruction and FFA activities and the actual time they spend on classroom instruction and FFA activities.
13. Perceptions on the importance of time in each component change over time.

Conclusion: Classroom instruction has the lowest average MWDS of the components of the three-component model of agriculture education.

If MWDS can be evaluated as a needs assessment, then Georgia's agriculture education teachers need training or support in classroom instruction. Classroom instruction ranked last in average MWDS of all the components. Teachers feel comfortable in classroom instruction activities, but these tasks ranked lowest among the tasks included in the instrument. This could likely be caused by the amount of training in this area that prospective teachers receive in teacher education programs. Most of the instruction given through professional development in these programs deal with curriculum planning and pedagogy. Classroom instruction having the lowest discrepancy score is actually a positive for agricultural education. As stated earlier, the classroom is where success in the other two components start. Through their training, teachers feel comfortable in the classroom setting, and that is essential for having success in the other components. The other assumption that could explain the low discrepancy scores in classroom instruction could be that the tasks associated with the questionnaire of this study were clerical in nature. Teachers feel more competent in these tasks because they are easy, and they just take time. Grading papers is not difficult if the teacher has the time to do it.

Conclusion: FFA activities have the highest average MWDS of the components of the three-component model of agriculture education.

Georgia's agriculture education teachers illustrated the least need through MWDS in FFA activities. In Georgia, the agriculture education teacher will be evaluated on the success of their FFA chapter. When the teacher is evaluated for their extended year and extended day pay, most of the evaluation will be of the FFA program. Teachers also understand the importance of the FFA program to students. The competition, skill acquirement, and opportunities for students through the FFA is often the reason for enrollment in agriculture education classes.

Conclusion: SAE supervision has a significant difference across years of teaching groups when comparing their MWDS.

When comparing MWDS to levels of teaching experience of the teachers surveyed, the only significant difference of any component was SAE supervision. This study has discussed the vague nature of a student's SAE project, and this is illustrated in the findings. Young teachers struggle with the idea and implementation of SAE projects. The community in which the program resides will dictate the opportunities available for SAE projects. If the community is different than the home community of the teacher, the teacher will have to relearn the SAE process. This is where the vagueness of a SAE serves the teacher in a positive effect. In urban communities where space is limited, a livestock SAE may not be an option, but an agriscience project could be easily completed. Over time, the teacher becomes satisfied with the SAE projects completed because they serve the students and the community.

Conclusion: Georgia's agriculture education teacher's demographics represent current trends.

Agriculture education has long been a vocation for white males, but agriculture education classes are becoming more diverse. Also, diversity could be the key in agriculture education helping to solve the agriculture industry's problems. Of this study's respondents, 58 were male, and 25 were female. Most of the respondents were male, but compared to Gilman, Peake, and Parr (2012) the number of males (72.00%) has decreased and the number of females (28%) have increase slightly in less than ten years. Cano and Miller (1992) found that 89% of respondents in their study were male. This trend of females coming into the agriculture education field will continue for a variety of reasons.

The easiest answer to this trend can be found in the agriculture education classroom. Females are becoming prevalent in agriculture education and the FFA. Now that the stigma of agriculture education has changed through policy, curriculum, and competition changes, females have more places to belong in agriculture education than before. With production agriculture receiving less attention in the classroom, and curriculum like agribusiness and agriculture marketing becoming commonplace in classrooms, females are becoming the leaders in agriculture education and the FFA. Another trend in agriculture education is the addition of middle and elementary agriculture education programs. Born under the need to develop a agriculturally literate society, agriculture education is moving among all age groups. The disparity between male and female teachers is not as great when teaching younger students. Golden, Peake, and Parr (2014) found in their study that 45.6% male while being 52.6% female. As these programs grow, more females will join the profession. No data was collected on race in this study.

The data collected in this study also illustrate Georgia's agriculture education teachers as young. The largest group in years of teaching experience were teachers with less than 5 years of teaching experience with 22 respondents being in that group. This trend is essential because nearly fifty percent of teachers leave the profession within their first five years of teaching (Ingersoll, 2003; Tippens, Ricketts, Morgan, Navarro, & Flanders, 2013). New teachers will continue to lead the landscape as older teachers retire or leave the profession to other industries. Great energies are expended to find and train new teachers. The training is designed to provide the new teachers with the tools needed to succeed in the classroom. Once in the classroom, positions are made, and strategies are implemented to keep them in the classroom. Much research is aimed at teacher recruitment and retention, and teacher attrition has also been an issue in agriculture education.

Conclusion: This study allowed for representation along all groups of years of teaching experience.

For this study to be successful, it needed input from an accurate representation of the population. Too many of one group would provide a snapshot of perceptions of the three-component model of agriculture education, but a representative sample allowed this study to investigate changes in perceptions over years of teaching experience. The largest group represented was teachers with less than 5 years of experience with 22, but the next two largest groups were the veteran teachers with 16-20 years of teaching experience and greater than 20 years of teaching experience. It was essential, and interesting, to investigate the differences and similarities of these groups, and the data could represent the attrition trend mentioned earlier. If half leave before year five, what happens to the half that stays in the agriculture education field?

Conclusion: Georgia's agriculture education teachers perceive classroom instruction as the least important component of the three-component model of agriculture education.

When investigating the average importance score for each component, the study found that classroom instruction ranked the least important to Georgia's agriculture education teachers. Classroom instruction is the starting point for agriculture education. It is in the classroom where students are taught the skills and knowledge needed to progress to bigger and better things. Ultimately, FFA activities and SAE supervision start in the classroom as well. The problem with classroom instruction tasks is that many of the tasks show no benefit to the teacher.

Many of the tasks studied have a tendency to feel like busy work for a teacher, and some of the tasks deal with mandatory tasks given to the teacher for accountability measures. "Including problem solving lessons", "Including leadership skills in lessons" , and "Including record keeping in lessons" all come directly from the Georgia FFA Organization's Program of Work. These tasks are evaluated to prove that a teacher completes the "minimum standards for an agriculture education teacher receiving extended day and year money" (C. Corzine, personal communication, September 29, 2021). When teachers complete tasks that they do not understand how it benefits them or their students they may not understand the importance of that task. In Georgia, many state and area staff do understand the importance of the Program of Work, but teachers often find fault in the minimum standards.

Conclusion: Georgia's agriculture education teachers perceive FFA activities as the most important component of the three-component model of agriculture education.

FFA advisors are competitive people, and they should enjoy being around their students. FFA activities provide the opportunity for the teacher to enjoy both things. Agriculture

educators in Georgia perceived FFA activities to be the most important when the tasks from each component were grouped together. For someone to have chosen agriculture education as a vocation, it can be assumed they had a positive experience with agriculture education when they studied in school. FFA activities are the fun facet of agriculture education, many students were inspired to teach when they left school and attended a CDE, State Convention, or FFA camp. Agriculture teachers understand how important FFA activities are to the development of their FFA members. When the students become the teachers, they remember how important that trip, competition, or livestock show was to them, and they want the same opportunities for their students.

The idea of promoting the FFA chapter was a driving factor in FFA activities being found as the most important component. "Promoting your FFA chapter to students" and "Promoting your FFA chapter to your administration" were the most important tasks throughout to whole study. "Promoting your FFA chapter to your community" was also ranked highly in importance. As education changes, promotion becomes increasingly important to ensure success of a FFA chapter. The administration support needed to run a successful program comes from good will from the FFA chapter. The administration will be proud of programs that serves students effectively, and the administration will enjoy celebrating success of FFA members. Promoting to students helps the program have the high achieving students needed to compete at the local, state, and national levels. Eventually, the community will support a program that is providing their industries with work ready students. Students have more choices than ever for extra-curriculars. It is important for FFA chapters to promote themselves, and success students are the best promotion tool.

Conclusion: Georgia's agriculture education teachers feel least competent in SAE supervision.

Georgia's agriculture education teachers felt the least competence in SAE supervision. Supervising SAEs can be difficult. Because students choose their SAE project, many of the projects will be vastly different. Agriculture teachers cannot be proficient in every possible area, and if the teacher cannot completely support the student in their SAE, teachers will feel less competence. By definition, SAEs take place outside of the school day. An agriculture educator's time outside of the school day is limited. Teachers have to schedule FFA and SAE activities around faculty meetings, grading papers, and other activities. The more time teachers stay at work, the less time they spend with their family. The ability to balance life and work has long been studied as a factor in agriculture teacher's job satisfaction or not being satisfied. Liability has become an issue is SAE supervision. Teachers are encouraged to not visit student's homes. This is due to teachers not having any control over the situation when it takes place away from the school. With all of these challenges, it would be hard for teachers to feel truly competent with SAE supervision.

SAEs are defined differently in a variety of places. An SAE in Camilla, Georgia may not be the same as an SAE in Macon, Georgia. Some places will have students managing hundreds of livestock animals as the SAE, and other places students may only have room for one tomato plant on a porch. A SAE in middle school will be different than a SAE in high school. Differing ability levels makes managing student's SAE project a chore for teachers. This fact lends to the idea that the three-component model should be fluid enough to fit the needs of students, communities, and programs, but SAE supervision will always be challenging because of its variety and the teacher's lack of control.

Conclusion: Georgia's agriculture education teachers spend most of their time in classroom instruction.

Georgia's agriculture education teachers reported spending 44% of their working time on classroom instruction. As reported previously, classroom instruction is the starting point for all of agriculture education, but if the three-component model is as represented, teachers should be spending 33.3% of their time on classroom instruction. Many factors could cause teachers to spend more time in the classroom. High stakes testing, teacher accountability measures, and other trends lead classes into the classroom. Teacher preference could also be a factor. 53.01% of teachers surveyed listed classroom instruction as their favorite component to spend time in.

Many hours will spent somewhere where the three-component model overlaps. FFA lessons in classroom instruction are mandatory for teachers in Georgia. Record keeping and leadership are also areas where classroom instruction could support FFA activities and SAE supervision. By spending time in the classroom on these lessons, a teacher can assure themselves that all students are getting the support they need to be successful. The students that want to take these lessons to the next level through CDEs or proficiency applications will need more support, but all students will have the skills and knowledge needed to be successful in the classroom.

Conclusion: The perceived ideal allotment of each component by Georgia's agriculture education teachers is closer to an equal split of each component than the actual time spent on each component.

Georgia's agriculture education teachers want to spend a more equal amount of time on each component than they actually do. Actual time in each component was reported as 44% of

time in classroom instruction, 31.60% of time on FFA activities, and 24.40% on SAE supervision. An ideal split for the teachers would be 40.24% in classroom instruction, 30.75% on FFA activities, and 29.01% on SAE supervision. Teachers want to spend their time split more equally through each component, but something is forcing to spend more time in the classroom and less time on SAE. Funding could be the obstacle. Teachers are paid by local boards of education that may not understand the other two components, but they hired a teacher to run the classroom. To make these decision makers happy, teachers could spend more time on classroom instruction than they would feel as ideal.

Conclusion: Georgia's agriculture education teachers perceive themselves as spending too much time on classroom instruction, about the right amount of time on FFA activities, and not enough time on SAE supervision.

One of the most interesting outputs from this study was when the research investigated the difference between ideal time and the actual time. The figure produced could lead to an assumption of perceptions of time. A positive number would indicate that the teacher was spending less time on that component than ideal. A negative number would indicate that the teacher was spending more time on that component than ideal. Large discrepancies, in any direction, could be caused by lack of training in an area, a difference between the demands of the job versus teacher preferences, or other challenges that cause the teacher to spend time outside of where they feel is ideal.

Using this assumption, Georgia's agriculture education teachers spend too much time on classroom instruction. Besides the factors already discussed, teachers ideal time could be affected by a misconceived view of ideal. If the classroom is the starting point for everything else, the time required to teach students is irrelevant. The foundation has to be laid before the

house is built. It may take more time than the teacher views as ideal, but until students have that foundational knowledge needed to be successful, the teacher must keep putting the hours in for classroom instruction. Every group of students are different, and some students may take longer to learn than others. The ideal time may not be achievable for every group, but teachers must provide the support that every student needs for the class, and the program, to be successful.

For FFA activities, the actual and the ideal times are similar. The amount of time spent on FFA activities could be traditional, in different ways, and that would explain why teachers actual time is less than one percent different from their ideal time. Many FFA programs are designed to be very similar to the FFA program that produced the teacher. The teacher views the amount of time as normal, and their difference between actual and ideal amounts of time would be similar. Some FFA activities are traditional through the chapter. New teachers to the chapter will learn the norms of the chapter, and that will be accepted as normal. Both traits explain why the difference between the actual amount of time and the ideal amount of time spent on FFA activities is so small.

A SAE project is not defined by the National FFA or the state associations. The amount of time spent on the project by the student is up to the local program, and that figure may differ with other programs. Some teachers may spend all weekend at a livestock show while other teachers may never spend time supervising an SAE. With this much variety, it would be difficult for any teacher to feel their actual time and their ideal time spent on SAE supervision to be similar. Teachers from SAE heavy schools could feel they spend entirely too much time on SAEs while teachers from SAE light schools could feel guilty that they spend next to no time on SAE supervision (Shoulders & Toland, 2017). Until a SAE is more clearly defined, or complete

freedom is given to teachers to design their own, this component will continue to vary wildly in time.

Conclusion: Teachers with 11-15 years of teaching experience perceive themselves to have the lowest difference between the ideal time spent on classroom instruction and FFA activities and the actual time they spend on classroom instruction and FFA activities.

How many years does it take for an agriculture education teacher to become comfortable in their job? Through time, a teacher can gain competence and confidence in what they are doing, and the tasks associated with their job should become easier because they have witnessed what did or did not work in their own classroom. The more experience, the more control over their environment due to experience. This research found a different trend where the group with the closest ideal focus versus actual focus was teachers with 11-15 years of teaching experience.

Teachers with 11-15 years of teaching experience illustrated the closest alignment of ideal focus on a component and actual focus on a component for classroom instruction and SAE supervision. More than any other group, teachers with 11-15 years of teaching experience ideal focus was similar to their actual focus. Is this confidence through experience, or is this the peak age for agriculture teachers? By investigating the research, it could be assumed that it takes 11-15 years to align your program to your own views. The interest question is why does the alignment peak at this point?

Conclusion: Perceptions on the importance of time in each component change over time.

When this study asked respondents to record their actual focus through the three components of the three-component model and their ideal focus through the three components of the three-component model, it was to be evaluated to find the actual amount of time spent in each

component. The interesting finding was when the study took the ideal focus of time and found the difference between it and the actual focus of time teachers spent in their programs. Along with years of service, the study could identify if the feelings on each component changes over time.

The feelings of teachers with less than five years of experience were found to be significantly different than teachers with 11-15 years of teaching experience and teachers with 16-20 years of teaching experience. As discussed earlier, the assumption could be made that it takes time for a teacher to align their program's focus to their own. Once aligned, this difference between ideal focus and actual focus would become closer to zero. This assumption is reinforced by the differences in the distribution of the age groups. The teachers with more years of experience have had the time, experience, and confidence to align their programs, but that does not stay that way. Teachers with less than 5 years of teaching experience were found to not be significant different than teachers with 20 or more years of teaching experience. The confidence and control gained earlier in their career fades at the end.

Recommendations for Practice

Based on the findings and conclusions of this study, specific recommendations were determined to benefit agriculture education and its teachers. These recommendations were surmised by evaluating the objectives of this study, and these areas were seen as areas of growth or opportunities to improve practices. Agriculture teachers, agriculture education state staff, teacher educators, and school administration can use these recommendations to improve their practices to improve the state of agriculture education.

The three-component model should continue to be the foundation for agriculture education. A mix of classroom instruction, FFA activities, and SAE have proven to be effective in producing high achieving students. Deficiencies in any component could lead to deficiencies in the experiences of the student. Every student needs to actively involved in the classroom. The class needs to fit the needs of the students. The class needs to be supportive enough for students who are struggling to improve while being challenging enough to keep the interest of the higher achieving students. The FFA program needs to be accessible to all students. Through the FFA, the students need to have opportunities to learn leadership skills, learn how to be a part of a larger organization, and many other soft skills that any student can use for any future vocation. All students need to have some sort of SAE project. The autonomy of this project will help students find meaning in their education while learning real world skills. The mandatory record keeping will be a meaningful lesson in planning and finance that will benefit all students.

All successes in agricultural education start in the classroom. Teachers need to continue to focus on classroom instruction as the starting point for the three-component model. If a student is built through agriculture education, the skills and knowledge learned in the classroom is the foundation. Research has proven that agriculture literacy is a problem, and agriculture education classroom is the solution. Not every student will join, and then be successful, through the FFA, but agriculture education lessons learned in the classroom will help agriculture market itself to the masses. Not all SAE projects will be productive. Students will pick a SAE where they can complete it quickly, and they will perform work in an area where they will learn little, but the hands on activities in the classroom will benefit them in the future. Teachers also need to understand that the more effective they are in the classroom, the easier FFA activities and SAE supervision become. In the classroom, the teacher can reach a wider group of students than they

can speaking to a CDE team or speaking to a few students while monitoring SAEs. The reach of the classroom can prevent extra hours for the teacher outside of school. The classroom is where teachers can get to know their students. The information gathered can help the teacher identify strengths and weakness, recruit students for other tasks, and align student interest with opportunities for that student to succeed. Teachers can start the basics of a CDE through the classroom environment. Once students start to learn and perform at high level, the teacher can evaluate the group. Some students will be inspired to compete for the CDE, or the teacher can identify students with ability to begin working in, and out, of school for success in that CDE. Students with leadership qualities recruited to FFA officer positions where they can apply leadership skills at a higher level. Classroom instruction can support SAE supervision as well. Lessons on record keeping and time management to a large class can save the teacher time in the future. Students can report their progress through their SAE as classwork to keep the SAE fresh on their mind, and these assignments can serve as an opportunity for the teacher to monitor the student's work and supervise the student's SAE from afar. Some stakeholders at the school and in the community will only care about what happens in the classroom. No matter the successes in FFA and through SAEs, the school administration needs the teacher to be able to control the classroom. A classroom where students are bored and unproductive will not benefit the school. The administration of a school needs to trust that the agriculture education classroom is full of students who are on task and will not cause problems. Very little, if any, FFA activities or SAE projects affect the school's report card. Some school board employees are only concerned with accountability measures that are given to the school and released into the community. Georgia's agriculture education teachers spent the most time in classroom instruction and they felt the tasks associated with classroom instruction were the least important, but the benefits of an effective

classroom cannot be discounted. An effective classroom benefits the teacher, the students, the school, and the community.

A definition of SAE needs to be established. This is a difficult task to begin with, and the source of the definition is unclear. With the differences in communities and the agriculture that is practiced, it would be difficult for the definition to come from the state level. The decisions that would be made would have to take into account the differences from around the state. Rural communities have different opportunities than urban communities. The idea of scale would have to be able to change to fit the needs of the students. Not all school systems operate the same schedule. Would the SAE be different for a yearlong class versus a semester long class? With some many obstacles, it seems not probable for the definition of a SAE project to come from the state level. The decision would need to be made at the local level.

The teacher, students, school officials, and community members could all provide input. The decision does not need to be made by one individual. A teacher who does not feel efficacy with SAE supervision could make a decision that could lead to the student's SAEs not reaching their full potential. If the SAE bar is set too low, students could miss opportunities to learn at a greater level. The decision needs come once the needs of all impacted are taken into account. Students need to be set up for success. The decision makers need to examine the opportunities available to the students. These opportunities could vary among communities and even vary throughout a class. When the decision is made, all students should have the opportunity to succeed. When defining the SAE, the teacher needs to remember the possibilities that come with the variances in SAE projects. A student who lives in an urban apartment cannot cut grass on their property, but they should the ability to conduct an agriscience SAE to complete their project. The needs of the agricultural education program needs to be evaluated before SAEs are

defined. The SAEs of the students should be productive enough to fit the needs of the program. The students should be able to show growth in their SAE through their time in agriculture education. This growth will benefit the program and its students through areas such as proficiency awards. The defined SAE needs to represent the needs of the community. The end result of SAEs and agriculture education should be to produce students who are ready to become useful members of society. In the end, the community is served. The work represented through SAE projects needs to be a reflection of the work needed in the community. Opportunities for work based learning and job shadowing could help align the student's SAE projects with the needs of the community.

Through this study the idea that not all schools and agriculture education programs are the same has continued to be identified, but the same could be said for agriculture education teachers as well. There is a chance that the teacher and program will not be a good fit. A teacher who is heavily involved in livestock exhibition may never find happiness in an urban program where no students have the ability to house livestock at their homes. A teacher versed in agriscience with no livestock background may never feel comfortable in a program with a traditionally strong livestock program. This imbalance could lead to frustration for the teacher, the school administration, and the community. Young teachers often take the first job they can get, but they may not have the tools to be successful in that program. They will have the opportunity to learn new skills, but they may never find efficacy working in a program that does not fit their views of agriculture education. Agriculture education state staff and school administration need to understand how to market their program to new teachers in order to hire an applicant who will fit the needs of the program. To understand the nature of the program, the administration needs to understand the three-component model. Is the program heavy in an area

because that would need to meet the needs of the teacher, or the administration would need to hire a teacher who is willing to change to fit the program.

A misalignment between the teacher and the program can have problematic results. A teacher who I know was groomed in an agriculture education program that focused mainly on FFA success. He had competed at the state and national level in CDEs, and he had been a state FFA officer. When he started teaching at a program with a historic livestock program, he began to feel uncomfortable. He had a young family, and he was not ready to spend 20 weekends a year at livestock shows all over the Southeast United States. He was very dissatisfied in his work, and he eventually left the profession. With teacher recruitment and retention at the forefront of agricultural education, teachers leaving for any reason is a problem. Understanding the differences could lead to less teachers leaving because they feel comfortable in a program that matches their beliefs.

The state agriculture education staff could be invaluable in helping programs find the teacher the program needs. The state staff know the programs through the work they do with programs and teachers, and they usually have a relationship with the students who will eventually become teachers. If allowed, they could recommend certain jobs to certain would be teachers to find the right teacher for that program. The teachers in programs that align with their beliefs would feel more comfortable, and they would feel the support that got them there. The state staff would have a better relationship with the teacher, and the staff member could evaluate the teacher, look for deficiencies, and align professional learning opportunities to support the teacher further in the future.

Funding from federal, state, and local boards of education can help the teacher provide more opportunities to the students. School funded agriculture mechanics shops, greenhouses,

and school farms could provide invaluable SAE opportunities to students. The teacher can assign times to have these venues open after school for students to apply what they learned in the classroom for their SAE. Students could build or fabricate a project in the shop using the tools provided by the agriculture education program. This will be more inclusive due to the varying socioeconomic backgrounds of students. Students whose families cannot afford tools could have the opportunity to learn skills while being supervised by a qualified teacher who will keep them safe and hone their skills toward the industry standard. The greenhouse could be useful tool for a student to start a business or conduct research. The teacher could supervise these SAEs without leaving the school. School farms are essential in teaching animal science today. Today's students are generations removed from the farm, and animal husbandry is a lost art in many areas of the country. If the school has a farm, students could house livestock and participate in livestock exhibitions. Learning these lessons could ensure that future generations understand where their food comes from, and they will understand the research, science, and art that goes into producing food, fiber, and shelter for human consumption.

The community could be a useful partner in providing SAE opportunities for students. Work based learning, internships, and job shadowing can provide the teacher with partners in providing opportunities students with quality SAEs. In an era where every organization is in need for workers, students could fill the gap by working in a career field that interests them. Teachers need to have beneficial partnerships with community members to allow for opportunities for students. Many businesses, especially in agriculture, could use the enthusiasm brought by young people. Agriculture teachers need to have an effective relationship with the school's work based learning supervisor. Many times, this person has their finger on the pulse of the community's employment opportunities. By working together, the WBL supervisor and the

agriculture education teacher can fill the needs of the community with hard working, agriculture education students. Work based learning allows students to receive school credit for working during school hours. If a student has an interest in an area, and there is opportunities in that area in the community, all organizations benefit if the student is placed to work while in high school. Internships and job shadowing are excellent ways for students to investigate careers and to apply their knowledge in the real world. For this to exist, the agriculture education teacher needs to build the relationship with companies who will let students fulfill their required SAE hours by working in an unpaid capacity.

Implications

The research illustrates many different trends associated with the three-component model of agriculture education. The data recorded gives insight into how teachers are spending their time, and where they want to spend their time, but the research does not illustrate any causation. One trend that highlights the difference in how agriculture education is designed and how it is operated is in the importance ratings of each component. Georgia's agriculture education teachers rated FFA activities and SAE supervision more highly than classroom instruction. Throughout this research, journal articles, textbooks, and many other sources refer to classroom instruction as the foundation for the three-component model. All knowledge and experiences through agriculture education starts in the classroom. Once learned, students should strive to become proficient. Once proficient, students can use that knowledge outside of the school environment and apply their skills and knowledge into competitive FFA events or through their SAE. If classroom instruction is not the most important aspect, can it support FFA activities and SAE supervision as the idea of agriculture education was established? If not supported properly, can the agriculture education program support the needs of all students?

The data provided by Georgia's agriculture education teachers issue a warning as to what goals and standards are being set. Each of these agriculture education programs will serve the needs of the administration and ultimately, the school. The school, and its administration, will need all students to be involved in a rigorous class that teaches the standards developed at the local, state, and federal levels. A school's administration will be interested in the assessments given through high stakes testing. These scores of accountability are what schools, and its programs, are evaluated on. These scores reflect the effectiveness of a programs effect on all students. For agricultural education programs to be successful in these assessments, all students need to be served in a fashion that fits their needs. This type of tailored instruction needs to happen in the classroom. It is the classroom where all students can be assessed to find misunderstand, and students who are struggling with a concept. Differentiation can be assigned in the classroom to serve all members of the class. This type of instruction lends itself to a goal of all students becoming proficient in the standards of the agricultural education course given by the school. Through remediation, students who become proficient faster can progress to the next level, and if that level is toward a FFA CDE then both components are satisfied.

By rating FFA activities and SAE supervision ahead of classroom instruction in importance is not a reflection of how agriculture education teachers are prepared. Teacher preparation courses tailor to success in the classroom. Classroom management, students with exceptionalities, and methods of teaching are all popular courses for future agriculture education teachers. If successful in the classroom, these teachers can then work on their FFA program and producing productive SAE projects. This type of teaching and learning will serve the needs of all students. Teachers who understand this importance will fit the needs of their school, and

provide the agriculture industry with students from a variety of backgrounds to serve the needs of the industry.

By rating FFA activities and SAE supervision above classroom instruction, Georgia's agriculture education teachers illustrate the saying "the tail wagging the dog." FFA activities and SAE supervision cannot drive classroom instruction for many reasons that would serve as a detriment to agriculture education. Firstly, FFA and SAE goals do not always include all students. FFA activities and SAE projects take a certain level of commitment. FFA activities happen outside of the school day, and many times, require travel to compete. SAE projects, especially livestock projects, take a time and monetary investment. If a student cannot deliver this level of commitment, they will not be represented in a class driven by FFA and SAE. The student could have all of the ability and drive needed, but not the money. This would lead to students being underserved. In a class ran to further a CDE team, this student could be left behind. He or she would not feel any sense of ownership in their education, and would likely not pursue further training through agriculture education. Conversely, many students would be overserved. The student who were active in FFA and had productive SAEs would be highlighted by the instruction, and they would receive the majority of the attention from the instructor and the curriculum. This could lead to the student becoming specialized in their agriculture education career. If a student is recruited into agriculture education for the sole purpose of on CDE, they may never get to experience all of the other important aspects of agriculture education. If the CDE were only driving inspiration for their involvement in agriculture education, their classroom experience and their SAE projects would suffer. This trend could also be introduced if SAE was the driving factor of the program. SAE projects were designed to happen outside of the school day, and students could apply what they learn in class in a real

world application. If SAE projects are the sole focus of the program, classroom time will be spent completing the SAE, not supporting it. This happens many times in competitive SAEs like livestock exhibits and agriculture mechanics contests. The SAE becomes the focus, but they lose their value when record keeping skills and time management go by the wayside.

Classrooms led by FFA and SAE cannot meet the needs of all students. The students who cannot, or will not, actively be involved in will not receive the training they need. Many times, their involvement, or lack thereof, will be beyond their control. A student could not have a ride after school, play a sport, or not have the socioeconomic background to be active. These students cannot be forgotten by the agricultural education program. They need to be given every opportunity to receive all they are able to from the agriculture education program. Besides student need, a program ran by FFA and SAE will never be accountable for the standards of the course. FFA and SAE are inter curricular parts of agriculture education, but they do not account for all the standards taught in a course. When they become the focus, important standards that do not align with FFA or SAE get forgotten. Teachers should have the ability to align their perception of the three-component model of agriculture education to fit the needs of their students, school, and community, but they should be responsible for all standards for a course. These standards were designed using a bigger picture than a community. They were written to serve agriculture as a whole.

Through the research, no measures were taken to gauge causation for the data. However, many of the trends represented allow the researcher to infer into certain causes. The most interesting was the difference in favorite component and most important component. These measures evaluated with the ideal focus versus the actual focus leads to a confusing outcome. Classroom instruction is Georgia's agriculture education teachers, favorite component to work

in, their least important component, and the component that they feel they spent too much time working on. It is difficult to process how one component can meet all of these criteria. For FFA activities, the teachers rated it as the most important, but teachers are split on if they spend too much, or not enough, time in this component. SAE supervision illustrated the lowest competence, but teachers rated it with higher importance than classroom instruction.

The logical reasoning would be to assume that individuals entering the agriculture education field where those that loved agriculture education in their educational career. A student who was active in FFA would be willing to spend too much time on classroom instruction to get to compete in CDEs or attend Summer Leadership Camp. A student with a SAE background would understand that the diverse component of SAE could lead to low competence in all areas, but the understanding of one area could bring that student high job satisfaction when they enter the agricultural education field. As determined earlier, FFA activities and SAE supervision should happen outside of the school day. That would mean time sacrificed from other facets of the agriculture education teacher's life. Could that sacrifice have any causation associated with classroom instruction being rated as the favorite component to spend hours working on. No matter the inspiration needed to drive students to become teachers, classroom instruction needs to be the essential part of the agriculture education program.

Recommendations for Teacher Preparation and Professional Development

Teachers draw from their experiences when designing their own agriculture education program (Blackburn & Robinson, 2008). The agriculture education program they participated in as students, and the agriculture education programs they witness as apprentice teachers will melt together to form the program of their own. It will benefit all future teachers if they can experience as many different programs as possible. Many institutions have opportunities for

students to observe agriculture education programs long before they become student teachers. This allows students to evaluate aspects that they see in other programs and decide if it they will incorporate the task, assignment, or activity into their program. Having students be able to observe effective teachers, where they can use them as models, is an effective way to increase the scope of the future teacher.

Most classes in teacher education programs focus on the classroom instruction component of the three-component model. Future teachers learn about students with disabilities, learn important instructional technology, and learn about student learning styles, and these lessons are essential to operate in the educational landscape of today. These classes allow the teacher to lead a classroom where students will be served, and all local, state, and federal mandates will be followed. Very little training in CDEs and SAEs occur in a teacher education program. This is understandable due to vast amount of options that make up these components. Today's FFA activities and SAE options would look foreign to teachers only few decades ago. Students can compete in CDEs that highlight the student's ability to sell agricultural products. No longer are competitions skills and knowledge tied directly to the farm. It would be impossible to give every student experience in every CDE, but students could be encouraged to explore new CDEs in other ways. Future teachers could be required to help with, or judge, CDEs in which they have no experience. Over their educational career, the student could become familiar with the CDE, and that could provide opportunities for their students in the future. SAEs are another complex topic to try to teach in a teacher preparation course. Teachers would need to be versed in agricultural mechanics, animal husbandry, and statistics to be able to supervise every type of SAE, but students could have the ability to judge proficiency awards or monitor students under another teacher to learn how to supervise a variety of SAEs. These

opportunities increase when teacher education programs work closely with its State FFA Association.

The new agriculture education teacher needs to feel the freedom to align their use of the three-component model to the needs of their students, program, school, and community. During their training, future teachers should be able to witness how the three-component model can change to fit the varying needs of the program. This alignment will help teacher feel more comfortable in their program. If agriculture education does not mandate requirements for an SAE, it needs to fit the local needs, but the teacher needs the autonomy to change the model. Some areas may need more classroom time, and some programs have historic livestock show teams, but the requirements need to allow all students to be successful through their agriculture education experience.

Recommendations for Future Research

This study endeavored to illustrate the differences in a teacher's ideal situation and the actual time spent in each area of the three-component model, but with some extra investigation, the study could have achieved more. A qualitative portion added to the study, or added as a follow up could record the reasons why there is a difference in ideal focus and the actual focus of programs. Teacher retention and recruitment, teacher job satisfaction, and teacher accountability are all popular subjects in agriculture education, and this study could be replicated and added to in order to infer into all of those topics. Teacher retention has always been a problem for agriculture education, and agriculture education classroom need effective teachers. If a self-reported job satisfaction score was included into the research, the researcher could look for a causation of a large difference in the ideal focus and the actual focus as a predictor of positive or negative job satisfaction scores. It is easy to assume that a large difference in the ideal time and

the actual time would lead to dissatisfaction in the job. Dissatisfied teachers would be more likely to leave the profession. This study could have mixed methods approach where quantitative and qualitative responses could be used to locate causation.

A similar study using the responses of administrators and community stakeholders could be useful in trying to align the needs of the school and the community to the teacher of the agriculture education program. By surveying administrators, the research could guide decision makers to many useful conclusions. The ideal focus of the program by an administration could guide the researcher to a conclusion of what administrators want in an agriculture education program. This could be used to help align our programs to the administrators whose support is essential to our programs. This research could also highlight where disconnects can occur. An administrator could not understand the importance of FFA activities or SAEs, and means could be established to correct the misunderstanding. The same could be done with community stakeholders who need bright students who know to work hard with problem solving skills. In this study, tasks were identified that easily fit into one of the components of the three-component model. A similar study could be used to evaluate the needs of employers. Facets of each component could be broken down to investigate the needs. Effective spoken communication could be a need that is solved through FFA involvement. The ability to work independently could be learned through the student's SAE project. Through this study we have repeatedly reported that SAE is not defined by any entity, and that is partially done by design. SAEs need to fit the needs of students, and one area will not necessarily have the same needs as another. If the a researcher wanted to remove some of the vagueness of the SAE, and they wanted to help define SAE as a help to agriculture teachers, school administrators and persons in the agriculture industry could be important partners in that process. Through qualitative or quantitative

measures, a better understanding of the view of school administrators and people involved in the agriculture industry could help the researcher find solutions to many of agriculture education's problems.

The three-component model was developed to illustrate where the most benefit resides to students. The area of the Venn diagram where all three circles overlap illustrates where agriculture education students receive the most benefit. To understand how the three-component model benefits students, its effect on current and former agriculture education students could be investigated. Research into the experiences of active members could be used to focus the programs recruit plan. A qualitative survey with a small sample size could help researchers investigate why students enrolled in agriculture education classes and why they stayed. Former students could be surveyed on which components led to successes in their lives. Many of the tasks surveyed in this survey will not fit the needs of a study of current or former students, but the premise of the study could remain the same. The aspects reviewed could identify the parts of a student's agriculture education experience where they perceived the most value through a MWDS.

One of the most interesting findings in this study was how Georgia's agriculture education teachers view of time spent in each component changed over time. All teachers felt that they spent too much time on classroom instruction, but teachers with 11-15 years of experience where three times closer to balancing their time accurately than every other group. FFA activities illustrated that the teacher's views changed over time. Beginning teachers and teachers with 16-20 years of teaching experience felt they spent too much time on FFA activities, but all other groups felt they needed to spend more time in this component. A research study to find why these changes take place would be beneficial to understand how teachers change as

they earn more experience. Are the changes due to experience, home life, or other factors that change when a teacher ages? A qualitative aspect to a study similar to this study could give insight into how a teacher's view change over time. Allowing veteran teachers to reflect on their years of experience could also allow a researcher to investigate how the teacher's views changed and why that change happened. Understanding this career arc could help decision makers design professional learning or workshops to help teachers at all levels of experience because this study illustrates that all groups are not the same.

When designing the questionnaire, I not only used my experience teaching agriculture, but I used the Program of Work (POW) that all of Georgia's agriculture education teachers are evaluated by. Tasks included in the POW are essential to the teacher receiving their extended year/ extended day pay. When teachers are evaluated, they must prove that they completed all of the tasks. Similar research to this study could be used to determine teacher's perceptions of importance and their efficacy on the tasks they are evaluated upon. This research could detail the importance of the tasks associated in the POW. If the task is important to teachers, it should be an essential part of the POW, but objects of low importance would need to be evaluated to see if that task is truly important enough to be included as an assessment piece. Many tasks lose relevance due to changes in technology or changes in the agriculture industry. If the task is no longer important, it should be amended to fit the needs of today's agriculture education teacher. Efficacy scores could be used to determine needs in teacher training and professional learning. The tasks that determine pay are crucial. Teachers who are stressed with the opportunity to lose pay will be difficult to retain. A quantitative research design could help investigate where teachers need help in achieving all standards. With this data, a program could be produced to help teachers who are struggling to meet standards.

School level administration and FFA staff should also participate in research similar to this study and a study investigating the tasks of the POW. A task might not seem important to a teacher, but it may be essential to the school administration. Such tasks need to be highlighted in teacher education and professional learning. Teachers need to understand why a task is important for them to put forth the effort in completing the task. If the teacher does not understand the importance of a task, the task will not receive the teacher's full attention. This is especially true in areas with high importance and low efficacy. FFA staff could highlight tasks that may not seem important to teachers, but the task could be essential to FFA documentation. With data from teachers, administrators, and FFA staff, a relevant POW could be established. Once established, it could better serve today's agriculture education teachers. If teachers do struggle under the new standards, decision makers would have data to determine why and how they can help teachers.

When surveyed, if any task obtains a low MWDS from teachers and administrators, it needs to be evaluated. Many of the lowest scoring items in this survey are school level tasks. Having daily lesson plans is an example of a task that is required at the school level. An agriculture education teacher's time is already scarce. Review of other studies in this research illustrated that agriculture education teachers work much more than your average, 40 hour, work week. Any added task will take time away from the teacher. If that task is unimportant to the teacher, and it is unimportant to the administration, it should no longer be mandatory. Unlike reality, today's teacher has to perform certain tasks in order for a box to be checked by someone else. Freedom from these tasks would allow the agriculture education teacher to allocate more time to activities where their ideal time was less than their actual time like SAE supervision. Many times, school level responsibilities and agriculture education responsibilities could

overlap, but they do not. In the county in which I currently teach, we have mandatory professional learning through the school system. I am also tasked with completing professional learning through agriculture education through my POW. I cannot use one for the other. My professional learning for the school cannot count for the POW, and the professional learning for my POW cannot count for my school level professional learning.

Chapter Summary

The three-component model of agriculture education should remain the foundation of how we educate society in agriculture. Students learn new skills and knowledge in the classroom, apply their new knowledge through their SAE, and learn leadership through FFA activities. This system, adopted by many other educational programs, is effective in educating young people. All agriculture education teachers should have the content knowledge and pedagogical skill to teach in the classroom. The teacher should provide supervision to students' SAE projects, and they should work to provide SAE opportunities to all students. The teacher should serve as a FFA advisor and allow students to compete at the local, state, and national level. Through this system, we can provide the agriculture industry with the workers needed for the future.

The classroom is where all the learning starts. If the teacher uses classroom instruction to support FFA activities and SAE supervision, they can equate the time spent in all three components. The hands-on, self-guided nature of the SAE can give the student a sense of ownership in their education, making them more invested, but ancillary skills like record keeping or presenting the SAE can take place in the classroom. FFA activities allow students to compare their skills with other students from around the nation, and the FFA can be the place inside of school where students can belong. For students to understand their opportunities in the FFA, the

teacher can use classroom instruction to clarify the options. Inside of the classroom is where the teacher and students will get to know one another. That relationship can help the students and the agriculture education program grow.

What makes a SAE project needs to be defined. The vagueness of the SAE project causes the unrest in dealing with SAEs we see in this study. Either decision makers need to make the definition or teachers should be given the freedom to define it themselves. No matter who makes the definition, it needs to be made with the needs of the students, school, and the community in mind. The minimum standard for SAEs needs to be where all students can be successful. All students can benefit from a SAE project whether they live on a large farm, or they live in an apartment in an urban setting. The idea of a SAE needs to be fluid enough to ensure that all students have the opportunity to benefit from this type of learning.

Much of the data from this survey illustrates the gap from where teachers are from where they want to be. Many of the trends highlighted by the survey could be resolved through training. During the time that teachers are being trained, they are prepared for teaching in the classroom. The classroom is the starting point for all of agriculture education, but future teachers need to be trained in FFA and SAE to be ready to teach agriculture education. Local, area, and district contest are always looking for judges and students who desire to be agriculture education teachers could be welcome volunteers. Having a mandatory policy of apprentice teachers training CDE teams could help prepare them for the future. There is no guarantee that individuals came from agriculture education programs that required quality SAEs, and if they are not trained, it cannot be expected for them to train their students to have quality SAEs. Future teachers could take a class or workshop involving the parts of SAEs, or the same students can volunteer to help judge proficiency awards through the FFA. Proficiency awards are the highest

level of SAEs, and the students could benefit from seeing the best of the best. Teachers are required to monitor SAEs and lead FFA activities, and they need to be trained to complete that task.

Once in the classroom, the teacher needs the freedom to adjust the three-component model to fit their strengths, the needs of their students, the needs of the school, and the needs of the community. The teacher has to take ownership of their program. To do that, the need to highlight their strengths while improving their weaknesses. If the teacher has the knowledge and skill to lead a productive FFA chapter where students learn at levels high enough to compete at the national level, they should be able to accomplish that. The students need to be to successfully finish their SAE, and they should have an FFA program to belong to. The school should be served by the agriculture education program. The program should support the core contents, and the program should produce quality students with problem solving skills through hands on learning. The community can be proud of program like that, and the community will support the agriculture education program providing more opportunities.

Support from the school administration is essential for the agriculture education program and the teacher. It would be interesting to perform a similar study to school administration and agriculture education and FFA decision makers. Many tasks of the classroom teacher have their origins from the administration. These tasks have value somewhere in the school, and the teacher needs to understand the importance of the task. An insight into the minds of school administration would also let decision makers evaluate if what we are asking of agriculture teachers is in line with what the administrators want from the same teacher. Tasks important to the administration, but not the teacher, should be explained to illustrate the importance to the school. When the teacher understands the importance, they will gain proficiency in that area.

Any task that is unimportant to all parties needs to be evaluated by necessity. If that task is not necessary, it should not be mandatory. Tasks important to all parties will have the relevance to remain mandatory.

All teachers change and adapt over time. Some tasks get easier while some get more difficult. A one size fits all support system for agriculture education does not fit the needs of the teachers. As teachers grow, they gain resources and content that can make teaching easier. They can learn a rhythm and timing to pace themselves through each class taught, but as they get older, the gap between them and their students get wider. This study illustrated how teachers' views of time spent in each component can change over time, but the changes were not linear in nature. The responses given by the teachers indicate that certain tasks will illustrate a growing proficiency then the efficacy will fade, and the task will become difficult again. What influences that change could advance teacher training and professional learning.

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Auburn University Human Research Protection Program

EXEMPTION REVIEW APPLICATION

For information or help completing this form, contact: **THE OFFICE OF RESEARCH COMPLIANCE**
Phone: 334-844-5966 Email:IRBAdmin@auburn.edu

Submit completed application and supporting material as one attachment to IRBsubmit@auburn.edu.

1. PROJECT IDENTIFICATION **Today's Date** 11/19/2020

a. Project Title Assessing Agricultural Educators Belief in the Importance and Efficacy in the Three Component Model of Agricultural Education

b. Principal Investigator Jeff Wilson Degree(s) Specialist
Rank/Title Ph.D. Candidate Department/School Curriculum and Teaching
Phone Number 478-447-0900 AU Email jaw0066@auburn.edu

Faculty Principal Investigator (required if PI is student) Dr. James Lindner
Title Professor Department/School Curriculum and Teaching
Phone Number 334-844-5797 AU Email jrl0009@auburn.edu

Dept Head Dr. Marilyn Strutchens Department/School Curriculum and Teaching
Phone Number 334-844-6 839 AU Email strutme@auburn.edu

c. Project Personnel (other PI) – Identify all individuals who will be involved with the conduct of the research and include their role on the project. Role may include design, recruitment, consent process, data collection, data analysis, and reporting. Attach a table if needed for additional personnel.

Personnel Name Degree (s)
Rank/Title Department/School
Role
AU affiliated? ☐ YES ☐ NO If no, name of home institution
Plan for IRB approval for non-AU affiliated personnel?

lame Degree (s)
Department/School
? ☐ YES ☐ NO If no, name of home institution
approval for non-AU affiliated personnel?

lame Degree (s)
Department/School
? ☐ YES ☐ NO If no, name of home institution
approval for non-AU affiliated personnel?

– Have all Key Personnel completed CITI human subjects training (including elective modules related
ch) within the last 3 years? YES ☒ NO ☐

The Auburn University Institutional Review Board has approved this Document for use from 12/01/2020 to
Protocol # 20-573 EX 2012

Allow Space for the AU IRB Stamp

11/19/2020

e. Funding source – Is this project funded by the investigator(s)? ☒ YES ☐ NO
Is this project funded by AU? ☐ YES ☒ NO If YES, identify source _____
Is this project funded by an external sponsor? ☐ YES ■ No If YES, provide the name of the sponsor, type of sponsor (governmental, non-profit, corporate, other), and an identification number for the award.
Name_ _____ _____Type_____ _____Grant # _____

f. List other AU IRB-approved research studies and/or IRB approvals from other institutions that are associated with this project.

_____ _____ _____

2. Mark the category or categories below that describe the proposed research:

☐ **1.** Research conducted in established or commonly accepted educational settings, involving normal educational practices. The research is not likely to adversely impact students' opportunity to learn or assessment of educators providing instruction. 104(d)(1)

■ 2. Research only includes interactions involving educational tests, surveys, interviews, public observation if at least ONE of the following criteria. (The research includes data collection only; may include visual or auditory recording; may NOT include intervention and only includes interactions). **Mark the applicable sub-category below (i, ii, or iii).** 104(d)(2)

■ (i) Recorded information cannot readily identify the participant (directly or indirectly/linked); **OR**

- surveys and interviews: no children;
- educational tests or observation of public behavior: can only include children when investigators do not participate in activities being observed.

☐ *(ii)* Any disclosures of responses outside would not reasonably place participant at risk; **OR**

☐ (iii) Information is recorded with identifiers or code linked to identifiers and IRB conducts limited review; no children. **Requires limited review by the IRB.***

☐ 3. Research involving Benign Behavioral Interventions (BBI)** through verbal, written responses (including data entry or audio/visual recording) from adult subjects who prospectively agree and ONE of the following criteria is met. (This research does not include children and does not include medical interventions. Research cannot have deception unless the participant prospectively agrees that they will be unaware of or misled regarding the nature and purpose of the research)
Mark the applicable sub-category below (A, B, or C). 104(d)(3)(i)

☐ **(A)** Recorded information cannot readily identify the subject (directly or indirectly/linked); **OR**

☐ **(B)** Any disclosure of responses outside of the research would not reasonably place subject at risk; **OR**

☐ **(C)** Information is recorded with identifiers and cannot have deception unless participant prospectively agrees. **Requires limited review by the IRB.***

☐ 4. Secondary research for which consent is not required: use of identifiable information or identifiable bio-specimen that have been or will be collected for some other 'primary' or 'initial' activity, if one of the following criteria is met. Allows retrospective and prospective secondary use. **Mark the applicable sub-category below (i, ii, iii, or iv).** 104(d)(4)

☐ (i) Biospecimens or information are publically available;

☐ (ii) Information recorded so subject cannot readily be identified, directly or indirectly/linked; investigator does not contact subjects and will not re-identify the subjects; OR

☐ (iii) Collection and analysis involving investigators use of identifiable health information when use is regulated by HIPAA "health care operations" or "research or "public health activities and purposes" (does not include biospecimens (only PHI and requires federal guidance on how to apply); OR

☐ (iv) Research information collected by or on behalf of federal government using government generated or collected information obtained for non-research activities.

☐ 5. Research and demonstration projects which are supported by a federal agency/department AND designed to study and which are designed to study, evaluate, or otherwise examine: (i) public benefit or service programs; (ii) procedures for obtaining benefits or services under those programs;(iii) possible changes in or alternatives to those programs or procedures; or (iv) possible changes in methods or levels of payment for benefits or services under those programs. (must be posted on a federal web site). 104(d)(5) (must be posted on a federal web site)

☐ 6. Taste and food quality evaluation and consumer acceptance studies, (i) if wholesome foods without additives are consumed or (ii) if a food is consumed that contains a food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminant at or below the level found to be safe, by the Food and Drug Administration or approved by the Environmental Protection Agency or the Food Safety and Inspection Service of the U.S. Department of Agriculture. The research does not involve prisoners as participants. 104(d)(6)

New exemption categories 7 and 8: Both categories 7 and 8 require Broad Consent. (Broad consent is a new type of informed consent, provided under the Revised Common Rule pertaining to storage, maintenance, and secondary research with identifiable private information or identifiable biospecimens. Secondary research refers to research use of materials that are collected for either research studies distinct from the current secondary research proposal, or for materials that are collected for non-research purposes, such as materials that are left over from routine clinical diagnosis or treatments. Broad consent does not apply to research that collects information or biospecimens from individuals through direct interaction or intervention specifically for the purpose of the research.) **The Auburn University IRB has determined that as currently interpreted, Broad Consent is not feasible at Auburn and these 2 categories WILL NOT BE IMPLEMENTED at this time.**

***Limited IRB review* – the IRB Chairs or designated IRB reviewer reviews the protocol to ensure adequate provisions are in place to protect privacy and confidentiality.**

***Category 3 – Benign Behavioral Interventions (BBI)* must be brief in duration, painless/harmless, not physically invasive, not likely to have a significant adverse lasting impact on participants, and it is unlikely participants will find the interventions offensive or embarrassing.**

3. PROJECT SUMMARY

a. Does the study target any special populations? (Mark applicable)

Minors (under 18 years of age)	☐ YES ☒ NO
Pregnant women, fetuses, or any products of conception	☐ YES ☒ NO
Prisoners or wards (unless incidental, not allowed for Exempt research)	☐ YES ☒ NO
Temporarily or permanently impaired	☐ YES ☒ NO

b. Does the research pose more than minimal risk to participants? ☐ YES ☒ NO

Minimal risk means that the probability and magnitude of harm or discomfort anticipated in the research are not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests. 42 CFR 46.102(i)

c. Does the study involve any of the following?

Procedures subject to FDA regulations (drugs, devices, etc.)	☐ YES ☒ NO
Use of school records of identifiable students or information from instructors about specific students.	☐ YES ☒ NO
Protected health or medical information when there is a direct or indirect link which could identify the participant.	☐ YES ☒ NO
Collection of sensitive aspects of the participant's own behavior, such as illegal conduct, drug use, sexual behavior or alcohol use.	☐ YES ☒ NO
Deception of participants	☐ YES ☒ NO

4. Briefly describe the proposed research, including purpose, participant population, recruitment process, consent process, research procedures and methodology.

The purpose of this study is to understand the belief of importance and efficacy of Georgia's agricultural educators in the three component model of agriculture education. The population of this study includes current agriculture teachers in the state of Georgia. Participants will be contacted via email. Data will be collected using standard research methods through an online questionnaire via the online platform Qualtrics. Participants will be sent a link to the questionnaire along with a copy to the information letter (see recruiting email attachment). Participants will be asked to review the information letter and only complete the questionnaire if they understand their rights and agree to participate. Participants may choose not to participate by simply not completing the questionnaire.

5. Waivers

Check any waivers that apply and describe how the project meets the criteria for the waiver. Provide the rationale for the waiver request.

- ☐ **Waiver of Consent (including existing de-identified data)**
- ☒ **Waiver of Documentation of Consent (Use of Information Letter)**
- ☐ **Waiver of Parental Permission**

All retrospective information will be de-identified.

No indentifying information will be collected in order to protect participant's anonymity. The only record linking participants with the research would be consent documentation. Participants will incur no more risk of harm than they would experience in everday activities.

11/19/2020

6. **Describe how participants/data/specimens will be selected. If applicable, include gender, race, and ethnicity of the participant population.**

Participants will be purposefully selected to include current agriculture teachers in Georgia. Participants' contact information will be secured through the publically available Georgia FFA Teacher Directory.

7. **Does the research involve deception?** ☐ **YES** ☒ **NO If YES, please provide the rationale for deception and describe the debriefing process.**

8. **Describe why none of the research procedures would cause a participant either physical or psychological discomfort or be perceived as discomfort above and beyond what the person would experience in daily life.**

Risks in this study are minimal and are no more than encountered in everyday life. Participants will receive no direct benefits for their participation other than awareness of the content covered in the questionnaire.

9. **Describe the provisions to maintain confidentiality of data, including collection, transmission, and storage.**

Collected data will be entered into a spreadsheet and stored in password protected file in AU Box. Data files will not contain any potentially identifying information. It will take participants approximately ten minutes to complete the questionnaire.

11/19/2020

10. Describe the provisions included in the research to protect the privacy interests of participants (e.g., others will not overhear conversations with potential participants, individuals will not be publicly identified or embarrassed).

No deception will be used in any part of this study and no audio or video recordings will be collected. No sensitive subject matter or procedures will be used. Data will be collected with no direct links to individual participants. Data will be presented in aggregate form.

11. Will the research involve interacting (communication or direct involvement) with participants?
☐ **YES** ☒ **NO If YES, describe the consent process and information to be presented to subjects. This includes identifying that the activities involve research; that participation is voluntary; describing the procedures to be performed; and the PI name and contact information.**

11/19/2020

12. Additional information and/or attachments.

In the space below, provide any additional information you believe may help the IRB review of the proposed research. If attachments are included, list the attachments below. Attachments may include recruitment materials, consent documents, site permissions, IRB approvals from other institutions, etc.

The attachments include: an information letter, the recruitment email, and a copy of the questionnaire.

Principal Investigator's Signature _____ **Date** 11/19/2020

If PI is a student, Faculty Principal Investigator's Signature _____ **Date** 11.19.20

Department Head's Signature _____ **Date** 12/1/2020

Version Date (date document created): 11/19/2020

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AUBURN UNIVERSITY

COLLEGE OF EDUCATION

CURRICULUM AND TEACHING

(NOTE: DO NOT AGREE TO PARTIPATE UNLESS AN IRB APPROVAL STAMP WITH CURRENT DATES HAS BEEN APPLIED TO THIS DOCUMENT.)

INFORMATION LETTER

for a Research Study entitled

Assessing Agriculture Teacher's Belief of Importance and Efficacy in the Three Component Model of Agricultural Education

You are invited to participate in a research study on agricultural teacher's beliefs and competencies on the three component model of agricultural education. The study is being conduct by Jeff Wilson, Graduate Student, under the direction of Professor James Lindner in the Auburn University Department of Curriculum and Teaching's Agriscience Education Program. You are invited to participate because you are an Agriculture Teacher in Georgia over the age of 18.

What will be involved if you participate? Your participation is voluntary. If you decide to participate, you will be asked to complete a questionnaire via the online platform Qualtrics. Your total time invested in the study will be approximately ten minutes.

Are there any risks or discomforts? The risks associated with participating in this study are minimal and not more that encountered in everyday life. To minimize these risks, data will be collected anonymously and presented only in aggregate form. No direct links to your responses will be collected.

Are there any benefits to yourself or others? There are no direct benefits to your participation in this study. Benefits to others could include a better understanding of the training and support of agricultural education teachers in Georgia.

Will you receive compensation for participating? You will not receive any compensation for your participation.

Are there any costs associated with the research study? Other than your time, there are no costs associated with your participation.

If you change your mind about participating, you can withdraw at any time by not returning the distributed questionnaire by closing your browser window. Once you have submitted the anonymous data, it cannot be withdrawn because it

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CURRICULUM AND TEACHING

will become unidentifiable. Your decision to participate or not will not jeopardize your future relations with Auburn University, the College of Education, the department of Curriculum and Teaching, and the Agriscience Education program.

Any data obtained in connection with this study will remain anonymous. We will protect your privacy and the data you provide by maintaining your anonymous responses and insuring there are no connections between your responses and you. At the conclusion of this study, all data collected will be destroyed. Information collected through your participation may be used in presentations at academic conferences, journals, publications, and student research outlets (dissertations, thesis).

If you have any questions about this study, please contact Jeff Wilson at jzw0066@auburn.edu or Professor James Lindner at jrl0039@auburn.edu, 334-844-6707.

If you have questions concerning your rights as a research participant, you may contact the Auburn University Office of Research Compliance or the Institutional Review Board by phone (334)-844-5966 or email at IRBadmin@auburn.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE IF YOU WANT TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDE TO PARTICIPATE, THE DATA YOU PROVIDE WILL SERVE AS YOUR AGREEMENT TO DO SO.

5040 Haley Center
Auburn, AL 36849-5212

Telephone
334-844-4460

Fax
334-844-6789

www.auburn.edu

Jeff Wilson October 13, 2020
Graduate Student

James Lindner, Ph.D. October 13, 2020
Professor

The Auburn University Institutional Review Board has approved this document for use from _____ to _____, Protocol #_____

The Auburn University Institutional Review Board has approved this Document for use from 12/01/2020 to ---------- Protocol # 20-573 EX 2012

Dear Agricultural Teachers,

We are conducting this study and invite you to participate. This study is best taken on a desktop/laptop/tablet; given the type of questioning used participation on a smartphone may be problematic. You and other Agriscience teachers in Georgia are the only source of data for this study. We ask you to review the informed consent information sheet (details) and complete the accompanying questionnaire; your participation will take about 10 minutes.

Things you should now about your participation: Your participation is voluntary. You may stop participating at any time. You will not be compensated for participation. Participation involves minimal risk (no more than occurs during daily life). Information about participants will be kept confidential and no individual responses will be reported.

Please do not hesitate to contact Jeff Wilson if you have any questions about this research project. For further information, click the "Information Letter" link below.

Information Letter

This survey should take approximately 10 minutes to complete.

Thank you!

Jeff Wilson

Doctoral Candidate

Auburn University

jzw0066@auburn.edu

478-447-0800

James Lindner

Professor

Auburn University

Jrl0039@auburn.edu

334-844-6797

11/19/2020 Edit Survey | Qualtrics Survey Software

Wilson, Jeff Dissertation

Projects Contacts Actions Library Admin Help

Survey Actions Distributions Data & Analysis Reports

Wilson, Jeff Dissertation

Consent

Block Options

Q1.1 Assessing Agricultural Educators Beliefs of Importance and Efficacy in the Three Component Model of Agricultural Education.

We are conducting this study and invite you to participate. This study is best taken on a desktop/laptop/tablet; given the type of questioning used participation on a smartphone may be problematic. You and other agriculture teachers in Georgia are the only source of data for this study. We ask you to review the informed consent information sheet (details) and complete the accompanying questionnaire; your participation will take about 10 minutes.
Things you should know about your participation: Your participation is voluntary. You may stop participating at any time. You will not be compensated for participation. Participation involves minimal risk (no more than occurs during daily life). Information about participants will be kept confidential and no individual responses will be reported.

Please do not hesitate to contact Jeff Wilson if you have any questions about this research project. For further information, click the "Information Letter" link below.

Information Letter

This survey should take approximately 10 minutes to complete.

Thank you!

Jeff Wilson
Doctoral Candidate
Auburn University
jew0085@auburn.edu
479-447-0000

James Lindner
Professor
Auburn University
jrl0039@auburn.edu
334-844-0727

- I AGREE to participate (I have read the informed consent information sheet and agree to participate)
- I DO NOT wish to participate

Condition: I DO NOT wish to participate Is Selected. Skip To: End of Survey.

Add Block

Survey Overview/Directions

Block Options

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1/7

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11/19/2020 Edit Survey | Qualtrics Survey Software

Wilson, Jeff Dissertation

Projects Contacts Actions Library Admin Help

Survey Actions Distributions Data & Analysis Reports

Wilson, Jeff Dissertation

Consent

Block Options

Q1.1

Assessing Agricultural Educators Beliefs of Importance and Efficacy in the Three Component Model of Agricultural Education.

We are conducting this study and invite you to participate. This study is best taken on a desktop/laptop/tablet; given the type of questioning used participation on a smartphone may be problematic. You and other agriscience teachers in Georgia are the only source of data for this study. We ask you to review the informed consent information sheet (details) and complete the accompanying questionnaire; your participation will take about 10 minutes.
Things you should know about your participation: Your participation is voluntary. You may stop participating at any time. You will not be compensated for participation. Participation involves minimal risk (no more than occurs during daily life). Information about participants will be kept confidential and no individual responses will be reported.

Please do not hesitate to contact Jeff Wilson if you have any questions about this research project. For further information, click the "Information Letter" link below.

Information Letter

This survey should take approximately 10 minutes to complete.

Thank you!

Jeff Wilson
Doctoral Candidate
Auburn University
[illegible]@auburn.edu
479-447-0000

James Lindner
Professor
Auburn University
[illegible]@auburn.edu
334-844-[illegible]

- I AGREE to participate (I have read the informed consent information sheet and agree to participating)
- I DO NOT wish to participate

Condition: I DO NOT wish to participate Is Selected. Skip To: End of Survey.

Add Block

Survey Overview/Directions

Block Options

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11/19/2020 Edit Survey | Qualtrics Survey Software

D2.1

Directions: For each of the following tasks, indicate your perceived level of IMPORTANCE in the middle column, and your perceived level of COMPETENCY in the right column.

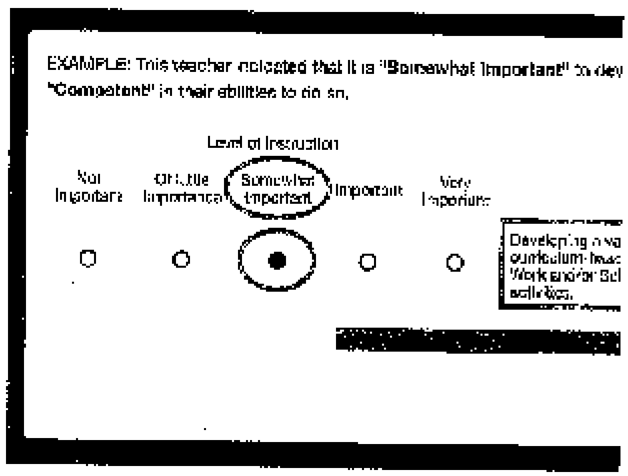
Overview: This needs assessment is comprised of four sections that ask your interest and level of competence regarding Instruction, FFA, SAE, and personal and program characteristics. Responses will be kept confidential.

Add Item

Example

Block Options

D4.1



D24

Which component do you enjoy working on the most?

- Classroom Instruction
- FFA Activities
- Supervised Agricultural Experience

Add Block

Technical Agriculture

Block Options

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2/7

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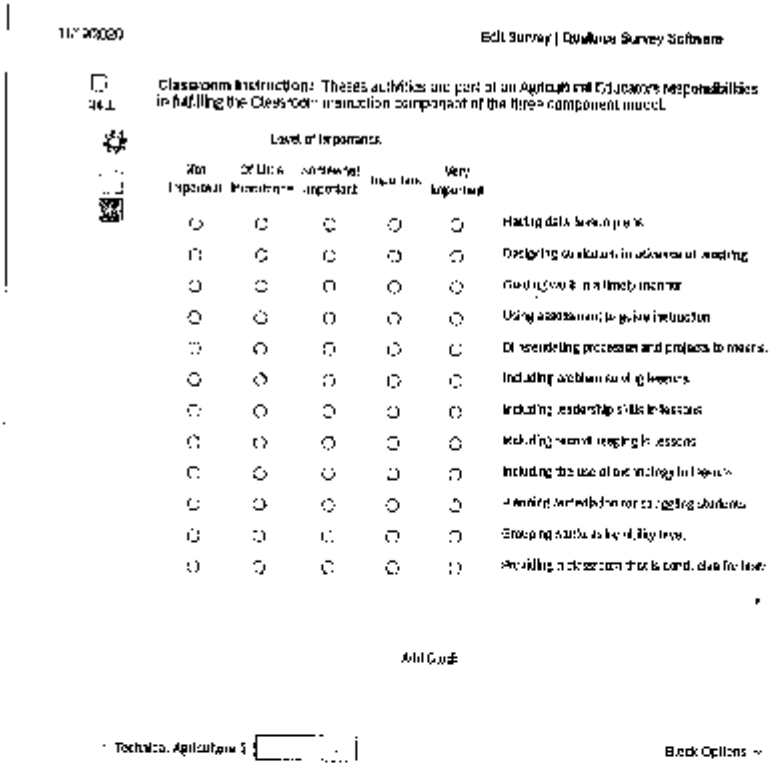

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Classroom Instruction: These activities are part of an Agriculture Educators responsibilities in fulfilling the Classroom Instruction component of the three component model.

	Level of Importance				
	Not Important	Of Little Importance	Somewhat Important	Important	Very Important
Hosting data literacy days	○	○	○	○	○
Designing curriculum in advance of teaching	○	○	○	○	○
Grading work in a timely manner	○	○	○	○	○
Using assessment to guide instruction	○	○	○	○	○
Differentiating processes and products to meet s	○	○	○	○	○
Including problem solving lessons	○	○	○	○	○
Including leadership skills lessons	○	○	○	○	○
Including real world engaging lessons	○	○	○	○	○
Including the use of technology in lessons	○	○	○	○	○
Providing activities for engaging students	○	○	○	○	○
Grouping students by ability level	○	○	○	○	○
Providing a classroom that is comfortable for lear	○	○	○	○	○

Add Code

Technica. Agriculture 1

Block Options

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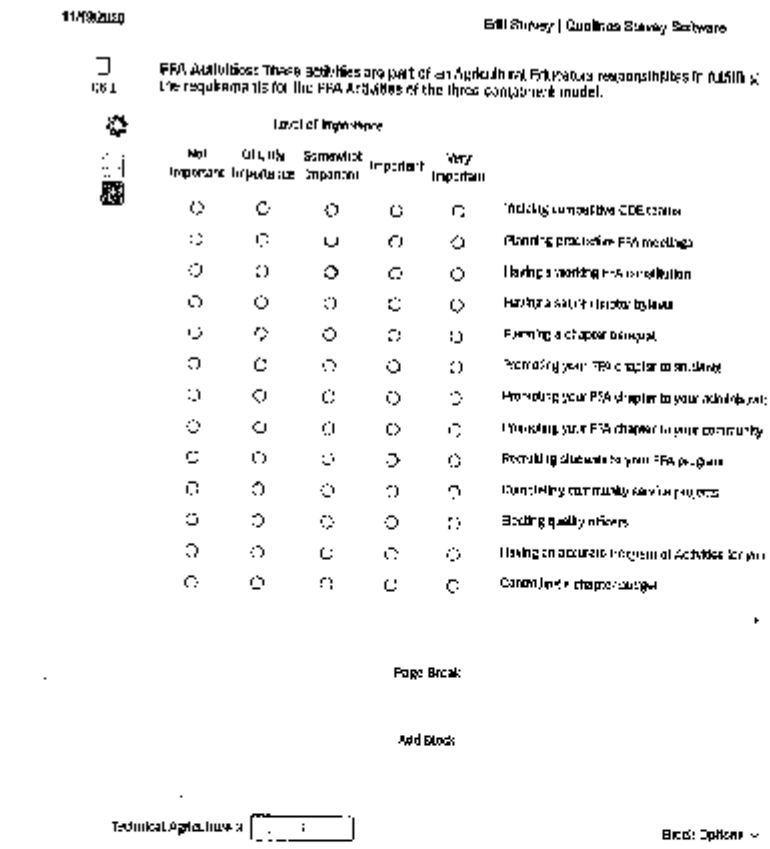
https://auburn.cal1.qualtrics.com/ControlPanel/Edit/Section/Blocks?surveyID=SV_9PGsAv1FMI25O29 Sv



11/19/2019 Edit Survey | Qualtrics Survey Software

Q5.1 FFA Activities: These activities are part of an Agricultural Education's responsibilities to fulfill the requirements for the FFA Activities of the three component model.

Level of Importance

	Not Important	Of Little Importance	Somewhat Important	Important	Very Important
Holding competitive CDE events	○	○	○	○	○
Planning productive FFA meetings	○	○	○	○	○
Having a working FFA constitution	○	○	○	○	○
Having a set of chapter bylaws	○	○	○	○	○
Forming a chapter banquet	○	○	○	○	○
Promoting your FFA chapter to students	○	○	○	○	○
Promoting your FFA chapter to your administration	○	○	○	○	○
Promoting your FFA chapter to your community	○	○	○	○	○
Recruiting students to your FFA program	○	○	○	○	○
Completing community service projects	○	○	○	○	○
Electing quality officers	○	○	○	○	○
Having an accurate Program of Activities for your	○	○	○	○	○
Completing chapter budget	○	○	○	○	○

Page Break

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Technical Agriculture 1

Block Options

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Q6.1

Supervised Agricultural Experience: These activities are part of an Agricultural Educators responsibilities in fulfilling the requirements of the SAE part of the three component model.

Level of Importance

Not Important	Of Little Importance	Somewhat Important	Important	Very Important	
○	○	○	○	○	Designing SAE programs that fit the needs of yo
○	○	○	○	○	Actively supervising students SAEs
○	○	○	○	○	Using common record keeping systems
○	○	○	○	○	Supervising livestock SAEs
○	○	○	○	○	Supervising agricultural mechanics SAEs
○	○	○	○	○	Supervising research in agriscience SAEs
○	○	○	○	○	Including financial information in SAEs
○	○	○	○	○	Reviewing the records of student's SAEs
○	○	○	○	○	Creating a deadline for the completion of SAEs
○	○	○	○	○	Students being able to show growth in their SAE
○	○	○	○	○	Helping students find job shadowing experience
○	○	○	○	○	Helping students with Work Based Learning [illegible]
○	○	○	○	○	Having students complete proficiency awards [illegible]

Add Block

Block 7

Block Options

Q13.1

For your program, please indicate the *actual percentage focus* of each item in the three component model. The total must equal 100%

Classroom Instruction	0
FFA	0
Supervised Agricultural Experience	0
Total	0

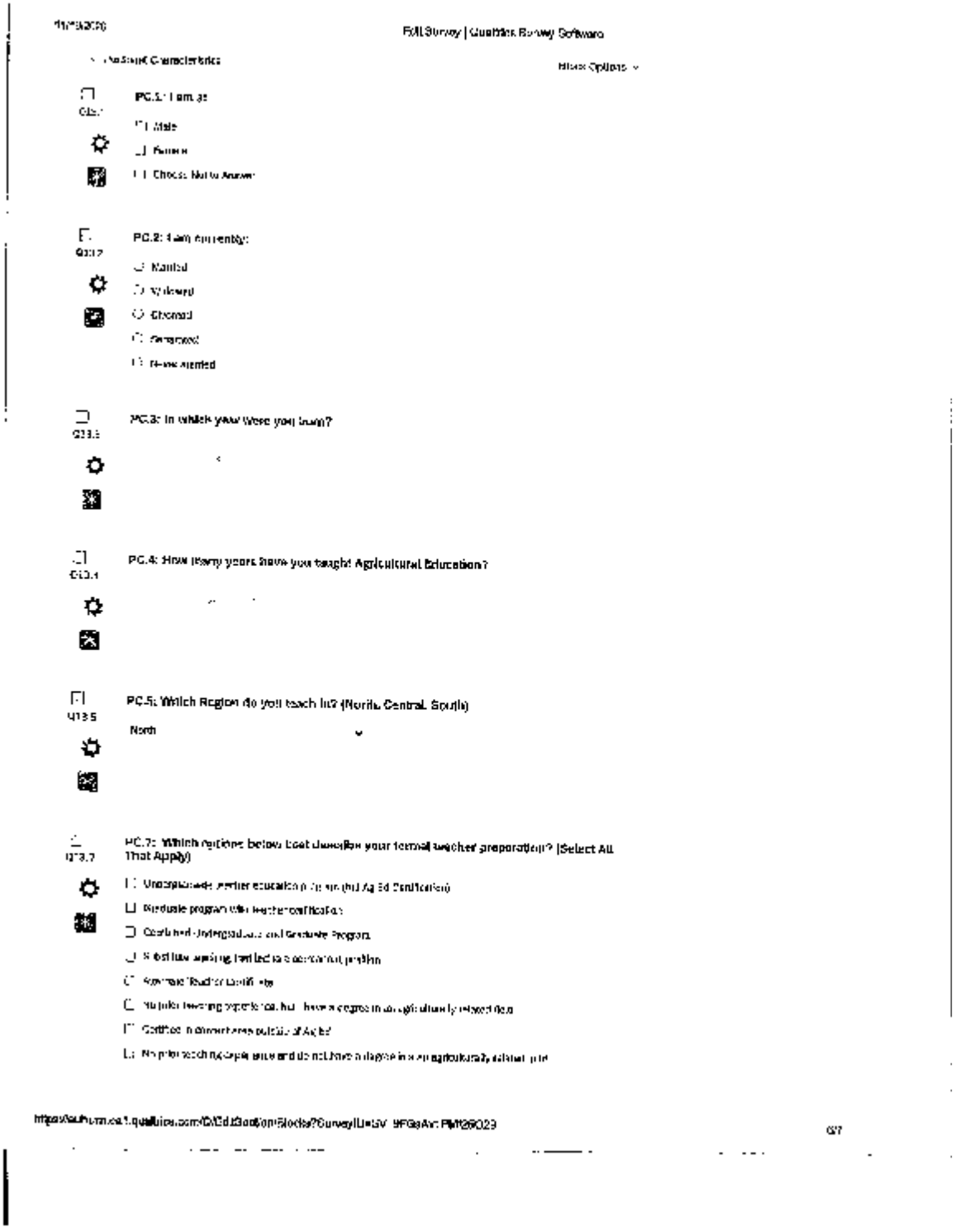
Q13.0

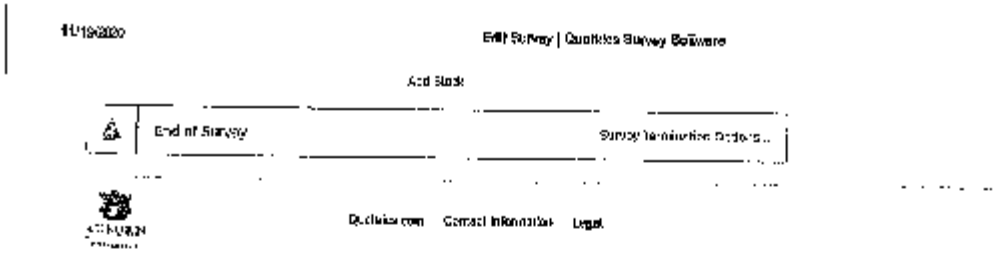
For your program, please indicate the *ideal percentage focus* of each item in the three component model. The total must equal 100%

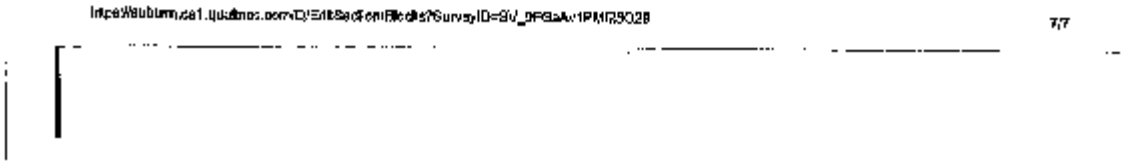
Classroom Instruction	0
FFA	0
Supervised Agricultural Experience	0
Total	0

Add Block

https://auburn.ca1.qualtrics.com/Q/EditSection/Blocks?SurveyID=SV_[illegible] 5/7


Participant Characteristics
Block Options
PC.1: I am a:
Male
Female
I Choose Not to Answer
PC.2: I am currently:
Married
Widowed
Divorced
Separated
Never married
PC.3: In which year were you born?
PC.4: How many years have you taught Agricultural Education?
PC.5: Which Region do you teach in? (North, Central, South)
North
PC.7: Which options below best describe your formal teacher preparation? (Select All That Apply)
Undergraduate teacher education program (i.e. BS Ag Ed Certification)
Graduate program with teacher certification
Combined Undergraduate and Graduate Program
Alternative licensing (certified in content, not ag)
Technical Teacher Certificate
No prior teaching experience, but have a degree in agriculture or related field
Certified in other areas outside of Ag Ed
No prior teaching experience and do not have a degree in agriculture or related field


Edit Survey | Qualtrics Survey Software
Add Block
End of Survey
Survey Termination Options...
Qualtrics.com
Contact Information
Legal


7/7

CITI PROGRAM

Completion Date 10-Feb-2019
Expiration Date 09-Feb-2022
Record ID 27508208

This is to certify that:

Jeff Wilson

Has completed the following CITI Program course:

Not valid for renewal of certification through CME. Do not use for TransCelerate mutual recognition (see Completion Report).

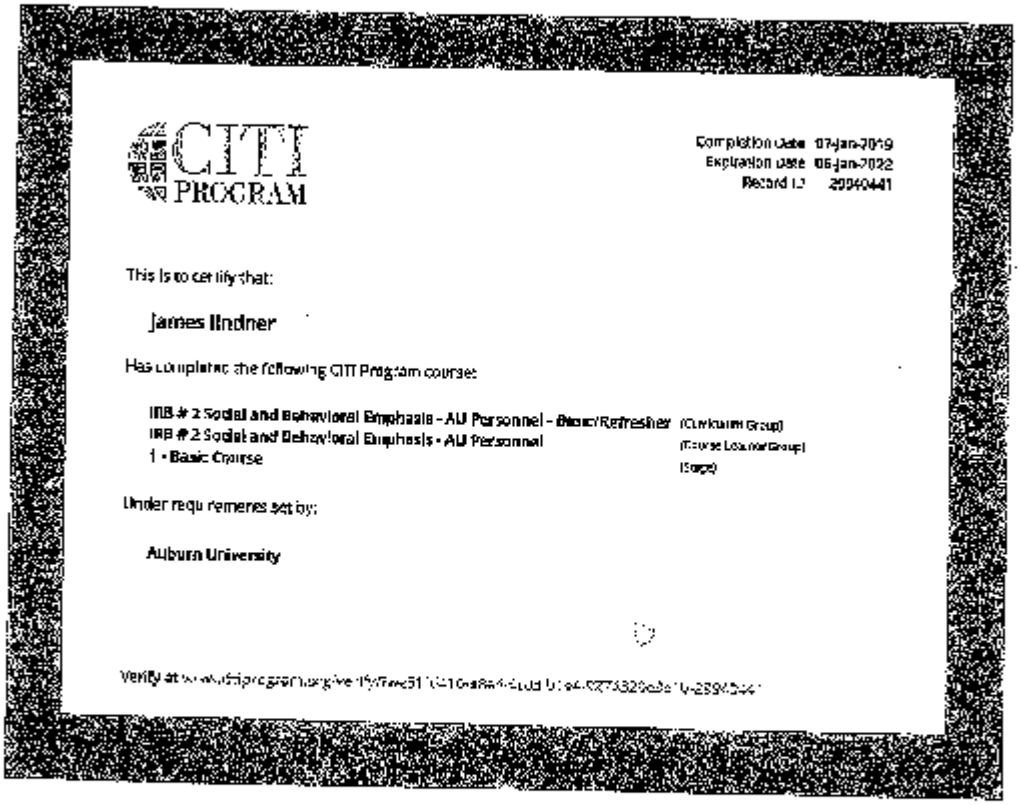
IRB # 2 Social and Behavioral Emphasis - AU Personnel - Basic/Refresher (Curriculum Group)
IRB # 2 Social and Behavioral Emphasis - AU Personnel (Course Learner Group)
1 - **Basic Course** (Stage)

Under requirements set by:

Auburn University

CITI
Collaborative Institutional [illegible] Training Initiative

Verify at www.citiprogram.org/verify/?w83839ae1-59d5-46b1-af7e-487994a93718-27508208



CITI PROGRAM

Completion Date 07-Jan-2019
Expiration Date 06-Jan-2022
Record ID 29940441

This is to certify that:

James Bodner

Has completed the following CITI Program course:

IRB # 2 Social and Behavioral Emphasis - All Personnel - Basic/Refresher (Curriculum Group)
IRB # 2 Social and Behavioral Emphasis - All Personnel (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

Auburn University

Verify at www.citiprogram.org/verify/?ee51[illegible]-239f544