The Economic Impact of Supervised Agricultural Experiences in Secondary Agricultural Education from a National Perspective

by

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Abstract

The purpose of this quantitative study was to examine, on a national level, the economic impact of the agricultural education students supervised agricultural experience programs (SAE), and determine whether certain demographic variables could be statistically significant predictors of economic impact. Experiential learning, commonly called SAE, is a well-documented, valuable, and integral part of Agricultural Education (Cheek, Arrington, Carter & Randall, 1994; Dyer & Osborne, 1996; Moore, 1988). Measuring the cost and economic benefits of SAEs provide valuable information in communicating additional benefits of SAE programs. The SAEs make a strong statement about the impact of student projects on the local economy (Cole & Connell, 1993).

The structure and format of this study was replicated from an SAE economic impact study by Hanagriff, Murphy, Roberts, Briers and Linder (2010). The study assessed values for the various SAE components and applied a multiplier (IMPLAN), that is widely used in industry, to project an economic impact for Texas SAEs (Hanagriff, Murphy, Roberts, Briers and Linder (2010). All 5,970 members of the National Association of Agriculture Educators (NAAE) were asked to participate in the study. There were 374 total responses representing all six regions of the NAAE. A multiple regression analysis was utilized to examine the relationship between the dependent variable (DV) economic impact with seven independent variables (IV) including region, school size, years of experience, number of teachers, number of students,

number of FFA members and number of students using record books Analysis of Variance (ANOVA) was used for testing the differences between means. The model that included all of the IVs was not statistically significant. An analysis of standardized beta weights indicated statistical significance for region, and size of school. Follow-up analyses indicated that schools were statistically significantly different based on size with very large schools having a p-value of .005. Therefore a predictive model for statistical significance of economic impact could be developed thus rejecting the null hypothesis. When the IMPLAN multiplier is applied to the economic values derived from the survey, there is a total per program economic impact of $116,000. This would suggest a national economic impact of $694 million based on the target population of 5,970 agriculture teachers.

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Chapter 1

Introduction

Background and Setting

The foundation of Agricultural Education in the United States can be traced to early

Georgia. Before sailing to America, James Oglethorpe planned a system of agricultural education

for the colonists. The plan included; making use of the Indian's agricultural practices,

establishing an experimental farm, and to provide special instructors and training for the

colonists in agricultural practices (Flatt, 2013).

Agricultural education first became a funded part of the public education system in 1917

when the United States Congress passed the Smith Hughes Act (Moore, 1988). Phipps, Osborne,

Dyer, and Ball, (2008) described Agricultural Education as the systematic instruction in

agriculture and natural resources at the elementary, middle school, secondary, postsecondary, or

adult education levels for the purpose of (1) preparing people for entry or advancement in

agricultural occupations and professions, (2) job creation and entrepreneurship, and (3)

agricultural literacy. Today over 800,000 students participate in formal agricultural education

programs offered in all 50 states and 3 U.S. territories (National FFA Organization, 2011).

The Agriculture Education program is made up of three integrated parts that can best be

illustrated by the Venn diagram of overlapping circles that demonstrates the dependent nature of

the three components (National FFA Organization, 2011. p.1.). Classroom instruction, FFA, and

Supervised Agricultural Experiences (SAE) provides students with opportunities for leadership development, personal growth, and experiences that lead to successful careers (National FFA Organization, 2011).

Classroom and laboratory instruction consists of those activities that provide learning experiences within the confines of a school facility. These classroom activities are characterized as learning activities designed by an agriculture teacher and presented to students through traditional instruction methods such as lecture, demonstration, guided and independent practice, review, and assessment. Instructional content includes agricultural mechanics, animal science, horticulture, agricultural production and biotechnology (Talbert, Vaughn, & Croom, 2006).

FFA is an instructional tool that compliments both instruction and supervised agricultural experience. FFA Chapters are designed to encourage students to perform well academically. In addition, FFA assists in the development of students' interest in agricultural careers through support of the Supervised Agricultural Experience program (Croom, 2008).

The Supervised Agricultural Experience (SAE) is an integral learning program for students enrolled in Agricultural Education courses. It is designed to provide learning experiences for students in the agricultural career pathway of their choice (Talbert, Vaughn, & Croom, 2006). Experiential learning, commonly called Supervised Agricultural Experience (SAE), is a well-documented, valuable, and integral part of Agricultural Education (Cheek, Arrington, Carter & Randall, 1994; Dyer & Osborne, 1996 and Moore, 1988). The SAE component establishes the independent, work-based instruction that is best described in the four lines of the FFA motto: *"Learning to Do, Doing to Learn, Earning to Live, Living to Serve"* (Hirschy, Kreigh, & Mdunke, 2012. p.19).

SAE's serve as the connecting link to the other components of the program and joins them together toward a common goal of developing the student for lifelong career success. Previous research has linked the educational value of Supervised Agricultural Experience (SAE) to student achievement and knowledge (Cheek, Arrington, Carter, & Randall 1994; Dyer & Osborne, 1996). The educational purpose and objectives built into the SAE also benefit students by challenging them to gain new skills and experiences (Bryant, 2003).The basis of the SAE program is to develop a relationship between the student, the agriculture teacher, the parents, and in some instances an employer, all working together in the selection, directing and supervision of the individual project. Phipps, Osborne, Dyer and Ball (2008) recognized that "SAE programs can fill a significant void in the application and transfer of acquired knowledge and skills, and often aid in the development of positive attitudes toward learning. In short, SAE programs bridge the gap between theory and experience" (p.445).

The SAE project will fit one of the following categories; entrepreneurship, where the student operates a business; placement, which involves a job or internship; research, involves an experiment; and exploratory, which involves career studies (National FFA Organization, n.d.). SAE's provide students with the opportunity to achieve individual success and recognition while serving to develop lifelong skills and work habits. Student success in the SAE program can result in proficiency awards at local, area, state and the national level. SAE participation is required for student advancement in the FFA degree program. SAE involvement connects various components and participants into a common result (Thies, 2005).

The Supervised Agricultural Experience not only allows for student learning, but also helps to add economic input to the local community. The SAE component of the agricultural

education program makes a strong statement about the impact that student projects have on the economy (Cole & Connell, 1993). These contributions can include investment in purchases of inventory (such as livestock and equipment), vehicle usage, and hotel rooms utilized for SAE related trips. Expense values translate into local and state business income which encourage growth in jobs and the economy.

The current economic environment for education dictates overall accountability and economic impact as essential criteria for validating educational funding for agriculture programs. Policymakers, industry officials, and others often need information on the total economic impacts of specific local economic sectors or on the impacts of various changes in the local economy (Hanagriff, Murphy, Roberts, Briers & Lindner, 2010). Changes in employment or output often occur locally as a result of new business locations, plant closings, regulatory changes, or other community events, and such changes have implications for other parts of the local economy (Mulkey & Hodges, 2000).

An August of 2013 funding report, by the Center on Budget and Policy Priorities, indicated that local school districts had cut a total of 324,000 positions over a 5 year period. These job losses have reduced the purchasing power of workers' families, in turn reducing overall economic consumption, and thus deepened the recession and slowed the pace of recovery (Leachman, & Mai, 2013). Value is a major factor in the staff reduction process. Value may be expressed in achievement results, economic impact or both.

Supervised Agriculture Experience (SAE) within the agricultural education program can contribute both to accountability of the program and economic impact to the local community community (McHugh, 2007). Measuring the cost and economic benefits of SAEs would provide

valuable information in communicating additional benefits of SAE programs (Cole & Connell, 1993).

Results from a study conducted by Hanagriff, Murphy, Roberts, Briers & Lindner (2010) found that Texas entrepreneurship SAEs contributed $103 million in direct spending to the Texas economy during the 2007–2008 school year. These results were applied to the IMPLAN Model, a method to measure economic value is the Impact Analysis for Planning (IMPLAN), an input–output database and modeling system that producers multiplier values from economic models to estimate the economic impacts of spending on a region's economy (Mulkey & Hodges, 2003). This model was created in 1993 from a University of Minnesota research team that originally used the model to measure the economic impact of the forestry industry, but now is a product of MIG, Inc. This model is used in many sectors to measure the value of expenditures and their extended value as the expenses ripple through the economy causing other increases in spending. Upon application of the IMPLAN Model to the direct spending totals of $103 million from the Texas study, there would be $189 million total economic value from SAE related spending. This level of economic impact is an important value and should be communicated to school stakeholders (Hanagriff, Murphy, Roberts, Briers & Lindner, 2010).

Today over 800,000 students participate in formal agricultural education programs offered in all 50 states and 3 U.S. territories (National FFA Organization, 2011). In the midst of the current economic environment these long-range values to the community serve to justify the overall need for the program (Hanagriff, Murphy, Roberts, Briers & Lindner 2010 and McHugh, 2010).

Statement of Problem

"The SAE concept is one of the unique characteristics that separates Agricultural Education from other subject areas" (Bryant, 2003, p. 5). The educational value and purpose of the Supervised Agricultural Experience (SAE) component of Agriculture Education and how it relates to student achievement and knowledge is well defined by previous research (Cheek, Arrington, Carter, & Randall 1994; Croom, 2008; Phipps, Osborne, Dyer & Ball, 2008). The SAE challenges students to gain new skills and experiences (Bryant, 2003). The SAE also requires financial investment in capital purchases, supplies, and travel expenses for the various types of project; Entrepreneurship, Placement, Exploratory and Research/Experimentation (Hirschy, Kreigh, & Mdunke, 2012. p.7). Previous studies have examined the economic impact of SAEs on individual states but there is little research to project this information to a nation-wide basis.

Purpose of the Study

The purpose of this study was to address the recommendation of Hanagriff, Murphy, Roberts, Briers & Lindner (2010) to track Supervised Agricultural Experience investments, expenditures and receipts on a national and a regional basis. The structure and format of the study is replicated from the Hanagriff (2010) study, completed in Texas in 2007-2008. This research would be an attempt to produce a quantitative estimate of the value of SAE's to the students' local economies on a nationwide basis and make a comparison of the value between the various geographic regions (NAAE regions I - VI) of the nation. **.**

The calculation of economic benefits utilized IMPLAN, a computer software package that consists of procedures for estimating local input-output models and associated databases. The acronym IMPLAN is for Impact Analyses and Planning. IMPLAN was originally developed by the U.S. Forest Service in cooperation with the Federal Emergency Management Agency and the U.S. Department of the Interior's Bureau of Land Management to assist in land and resource management planning (Mulkey & Hodges, 2008). This model is utilized in business, education and tourism by identifying economic benefits from spending money in a certain sector. IMPLAN economic benefits have several levels of multipliers, but the most comprehensive and conservative is the Type II multiplier value (Hanagriff , 2010). As a replicated study the IMPLAN values utilized by Hanagriff (2010), were calculated at $1.80 for agriculture expenditures and $2.09 for travel cost. This would indicate that an additional spending of $1.00 in the agriculture industry or travel industry would result in a total change in local output of $1.80 for agriculture and $2.09 for travel related values.

This quantitative data can be used to illustrate the economic benefits for agriculture programs and overall accountability to the various stakeholders involved in supporting the program (Cole & Connell, 1993). With the state of the economy, in terms of educational funding, this could serve a valuable function for justifying long range value of agriculture programs to the local communities. Economic values of Agricultural Education need to be communicated to school administration, state leaders, and potential funding sources that support Agricultural Education (Hanagriff, 2010).

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Research Questions

The following research questions were used to guide this study:

1. Which types of SAE projects produce the most economic impact?

2. What is the estimated economic impact, on a per-school basis, for students that are enrolled in Agriculture Education?

3. What is the estimated economic impact, for SAE projects nationally?

4. How will the economic impact of SAE's compare on a regional basis (NAAE geographic regions I - VI)?

5. Could a predictive model to determine economic impact be developed?

Null Hypothesis

There is no statistically significant difference in predictors. No predictor variable or combination of variables will account for a statistically significant portion of the variance in economic impact of SAEs.

Limitations

This study was limited to the responses received from secondary Agricultural Education teachers from across the nation, through a census survey utilizing a professional list-serve. When compared with other survey instruments, web surveys produce lower response rates than

computer-assisted telephone interview (CATI), interactive voice response (IVR), and mail surveys (Dillman, 1999).

The length of the instrument and time required for completion may have contributed to non-response and or partial responses. Since the survey is of actively teaching agriculture instructors, being able to commit the time to complete the documents may be a limitation.

Survey questions and subsequent responses are subject to the teacher's perception and interpretation. Due to the vast differentiation within this topic, the question and subsequent answer options could lead to unclear data because certain answer options may be interpreted differently by respondents.

Survey answers were based on teacher estimates and not on written and documented data from individual students. Therefore, a further limitation of the study was teacher estimation of the values implemented by the survey from their knowledge of the student's projects.

Assumptions

This study replicated an SAE economic impact survey conducted in Texas in 2007-2008 by Hanagriff, Murphy, Roberts, Briers and Lindner (2010). Due to the high cost for IMPLAN software per student, the Texas IMPLAN factor for agriculture ($1.80) and transportation ($2.09) was used to determine the economic input into the national economy. This assumes that Texas's economy for these industries, are representative of the nation.

Definitions

For the purpose of this study, the following definitions were used.

Agricultural Education- a course offered in middle and high school that introduces students to

   the various components of agriculture endorsed by Public Law 740 and funded by the

   Carl Perkins Vocational Act of 2002 (Dyer & Osborne, 1995).

Consumer Price Index (CPI) a measure that examines the weighted average of prices of

   consumer goods and services, such as transportation, food and medical care (Leachman,

   & Mai, 2013).

Experiential Learning- an experience based approach to learning in which students experience a

   phenomenon, reflect on that experience, draw conclusions, and test subsequent

   knowledge through performance (Phipps, Osborne, Dyer, & Ball, 2008).

FFA- the National FFA Organization also referred to as the Future Farmers of America, is an

   Intra-curricular organization of and for agriculture education students designed to

   prepare them for careers and lifelong success (National FFA Organization, 2011).

FFA Degree Program- FFA members can earn degrees as they progress through the phases of

   their leadership, academic and career skills development (National FFA Organization,

   2011).

Hatch Act of 1887- Designed to acquire and distribute agricultural based information and

   stimulate scientific investigation (Dyer & Osborne, 1995).

Impact Analysis for Planning (IMPLAN) the most widely employed and accepted regional

   economic analysis software for predicting economic impacts (Mulkey & Hodges, 2000).

Morrill Act of 1862- Provided for agriculture to be taught by at least one college in each state

   (Dyer & Osborne, 1995).

NAAE- the National Association of Agriculture Educators; The NAAE is a federation of fifty

    State agricultural educators associations with more than 7,650 members nationwide

    (National Association of Agricultural Educators, 2013).

Proficiency awards- An FFA awards program that recognizes the individual student's

    achievement within the supervised agricultural experience program (National FFA

    Organization, 2011).

Smith Hughes Act of 1917- The act that established the teaching of vocational agriculture in

    public high schools (Dyer & Osborne, 1995).

Supervised Agricultural Experience – The practical hand-on component of the agricultural

    education program that is conducted outside of the classroom for which systematic

    instruction and supervision are provided by their teachers, parents, employers and others

    (Dyer & Osborne, 1995).

Chapter 2

Review of Literature

Introduction

The foundation of Agricultural Education in the U.S. can be traced to early Georgia. Before sailing to America, James Oglethorpe planned a system of agricultural education for the colonists. The plan included; making use of the Indian's agricultural practices, establishing an experimental farm, and to provide special instructors and training for the colonists in agricultural practices (Flatt, 2013). To understand the movement which has resulted in the broad development of agricultural education in this country it is important to understand its relation to the general development and progress of science and education, the background of economic conditions, and the various organizations that promoted agriculture and country life (True, 1931). A long list of federal legislative acts profoundly influenced the nature of agriculture education instruction. These included; the Morrill Act, Hatch Act, Smith-Hughes Act, and the Carl Perkins Act, to name a few (Phipps, Osborne, Dyer, & Ball, 2008).

Agriculture education is based on a philosophy of learning through practice and application, individualized instruction, along with career and leadership development (Phipps, Osborne, Dyer, & Ball, 2008). The following learning theories that contributed to the development of the SAE project within agricultural education will be examined: behaviorism, constructivism and experiential learning.

With the aim of establishing a firm foundation of the literature related to the supervised agricultural experience (SAE) a review of the historical development of agriculture education, the components of an agriculture education program, the origin of SAEs and the learning theories supporting SAE significance will be explored.

Establishment of the Agricultural Education Program

While the roots of agriculture education in U.S. schools can be traced to the Eighteenth Century it was in 1855 that Michigan and Pennsylvania passed legislation for the establishment of Michigan Agricultural College and Pennsylvania State College for Agriculture. From this point there was a push from citizens and politicians from across the U.S. to advance the lives of farmers and rural people through the creation of the land-grant college system. The result of this drive was the Morrill Land Grant College Act of 1862 which according to Morrill "would lift up the intellectual and moral standard of the young and industrial classes of our country" (Moreland & Goldstein, p.117).

Evans stated "in its broadest sense vocational education is that part of education which makes an individual more employable in one group of occupations than in another" (Evans, 1971, p. 143). In accordance to this explanation, education in any specialized field could be considered vocational education. The three basic objectives in any school vocational education curriculum are as follows: (1) meeting the manpower needs of society, (2) increasing the options available to each student, and (3) serving as a motivating force to enhance all types of learning (Evans, 1971). Simplistically, vocational education can be described as practical education and career skill instruction (Friedel, 2011).

From the very beginnings vocational education included a combination of classroom instruction, hands-on laboratory learning, and on the job training, supplemented with student organizations (Friedel, 2011). According to Moreland and Goldstein (1985), there was "great debate whether their chief purpose was to provide vocational education only or a liberal education combined with some vocational applications" (p. 120). The result of the debate concerning liberal education versus vocational education was the Hatch Act of 1887, which established the agricultural experiment stations and then the Smith-Lever Act of 1914 which created state extension services.

Though secondary agriculture education in some areas precedes the Smith-Hughes Act of 1917, it was this legislation that established funding for vocational agriculture programs for high schools. The Smith-Hughes Act allocated federal funds to the states for the purpose of agricultural education. These funds were to be matched by state and local funds, and were to be used for the training and salaries of teachers, supervisors, and directors of agriculture, as well as programs in home economics, agricultural economics, and industrial subjects. In addition, the act required students to participate in work experience programs focusing on livestock or crop projects that were conducted outside the regular school day. This requirement of the act has been discussed by other researchers, including, Froebel, Dewey, Warmbrod, Lamar, and others (Moreland & Goldstein ,1985). Not all educators believed that vocational agriculture education was a good use of money, as a result the debate continued regarding pure academics versus vocational education. With the passage of the Smith-Hughes Act in 1917, a formalized structure was created for the vocational agriculture programs in secondary high schools throughout the United States (Camp, Clarke & Fallon, 2000). Even though formal agriculture education traces

back to early Savannah, Georgia, where Oglethorpe introduced agricultural education in the colony's founding (True, 1937), it was the Smith-Hughes Act that established strict guidelines for conducting agriculture education programs, improving the quality, and provided federal funding for increasing the realm of agricultural programs (Moore,1987).

"Agricultural education programs in the public schools are designed to accomplish educational objectives that pertain specifically to acquiring appreciation, understanding, knowledge, and skills applicable to the agricultural sciences, agribusiness, and the production and processing of food and fiber" (Newcomb, McCracken, Warmbrod, & Whittington, 2004, p.10).

Classroom and laboratory instruction, supervised agricultural experiences (SAEs), and student leadership development through participation in the FFA are the cornerstone features of school-based agriculture education programs. An agricultural education program is made up of three integrated parts that compose the three circle model for development (National FFA Organization, 2011). Classroom instruction, FFA, and supervised agricultural experience (SAE), provide students with opportunities for leadership development, personal growth, and experiences that lead to successful careers (National FFA Organization, 2011).Over the years, the composition of a comprehensive agricultural education program has been illustrated by a Venn diagram of three over-lapping, inter-locking circles representing classroom instruction, FFA, and supervised experience and the dependence one has upon another (Thies, 2005). Research supporting a comprehensive agriculture education program has been supported by several researchers including Cheek, Arrington, Carter, and Randell (1994). Another finding was that FFA and SAE are positively related to student achievement in agriculture (Cheek, Arrington,

Carter, & Randell,1994). Classroom instruction is the time for students to learn information and develop problem-solving techniques. FFA allows for leadership development through various awards, competitions, and conferences. SAE allows for the hands-on, application of knowledge and decision making outside of the classroom (Thies, 2005).

Classroom and laboratory instruction provide learning experiences within the confines of the school facility. Classroom and lab instruction is teacher-driven and consists of lecture, demonstration, and independent practice and assessment (Croom, 2008). Concepts learned in the classroom are supported through the   FFA and SAE projects that allow students to apply to real-world situations in an individualized manner. Agricultural theories and principles acquired through experiential learning opportunities be applied to the classroom and lab (Rettalick & Martin, 2008).

The FFA component serves as an instructional tool that compliments both the instructional program and the supervised agricultural experience. Through involvement in FFA activities students participate in career development events, individual member awards, scholarships and leadership activities. In addition, students are compelled to excel academically and to explore interests in agriculture careers (Croom, 2008) and (Phipps & Osborne, 1988). The SAE component of agriculture education provides learning experiences for students in a pathway of their choice and is the result of a cooperative effort involving the student, the instructor, the parents, and sometimes an employer. SAE activities occur outside of normal daily instruction in agriculture education. The SAE requires the student to keep records and apply the principles learned in the classroom to real world applications. Students that excel are rewarded through the FFA proficiency award program and degree programs (Croom, 2008).

Dyer and Osborne (1995) stated that over time, each of the three components have undergone immense changes, but none as great as the SAE. In the beginning, programs started out as strictly for farming operations, but then expanded to include placement and are now expanding to include experimental and analytical. Recent changes in the agricultural industry, the overall student population, society, the education system, and the ever changing workplace require changes in the scope of secondary agriculture education in order to meet the needs of today's students (Hughes, 1993). According to an analysis by Boone, Doerfert, and Elliot (1987):

Increasingly, for at least the past 30 years, a change in focus of agricultural education away from production agriculture to a wider array of food system interests has become evident. This lessening of focus has contributed to ambiguity and discrepancy, creating uncertainty about SAE (p. 57).

Since the majority of students in today's agriculture education classrooms are not coming from production agriculture backgrounds there is an increasing need for non-production oriented SAE projects. Phipps and Osborne (2008) stated:

High quality SAE programs do not just happen; they must be well planned and well managed. Likewise, very few students enter an agriculture program with an established SAE program. It is up to the teacher to first determine the goals and interests of the student, then to help identify the resources and projects that the student will need to do to complete the SAE, supervise the completion of each project, and carry out the necessary administrative record keeping associated with completion of the program (pp. 5-6).

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Challenges facing SAE projects includes limited agriculture background, lack of facilities, low student interest, inadequate time for supervision, large student-teacher ratios, student involvement in other school related activities and a broad range of socio-economic factors (Steele, 1997).

Development of the Agricultural Education Program

Agriculture education is truly a resilient program. Since its inception in the early 1900's when it was basically a farm youth development program for male students has greatly increased in diversity. Today the curriculum has expanded to include the many changes that we have evolved. Due to the changes occurring agriculture educators have had to be flexible to meet the needs of an ever-changing student. This adaptability and commitment anchors agriculture education into the future. One only has to follow the historical timeline to see the basis of this assessment.

By 1920, some 31,000 students were enrolled in agricultural courses and in 1928 the National FFA Organization was formed. During this period, agriculture education philosophy tended to follow the humanistic and pragmatic philosophy of John Dewey. The focus was on practical skills and developing a proficient agriculture system. During the second third of the century, more emphasis was placed on the science of education which was more in line the philosophy of mainstream education and the number of students enrolled in agriculture classes increased to 584,000. Warmbrod and Phipps (1966) summarized the changes in the focus of agricultural education from its inception until the 1960's. Warmbrod and Phipps further explained that prior to 1917, agriculture was taught as an informational or general education

subject. Following the Smith-Hughes Act there was an increase in the number of classes focusing on vocational agriculture and a reduction of classes oriented towards general education. Herbert Hamlin (1962), believed that this turn toward specialization lead to over-simplification of public school education. The general public perception at that time was that Agriculture Education is vocational in nature. Congress passed the Vocational Training Act of 1963, in order to expand the scope of agricultural education to include all areas of agriculture and broaden the scope of SAE's beyond the farm setting alone (Warmbrod & Phipps,1966).

The growth of the agriculture education program continued its upward spiral through the 1980's with student enrollments reaching 853,000 and the central philosophy continued to evolve. Phipps (1988) found the following:

> Since the 1970s agricultural educators have attempted to more directly define the philosophy of agricultural education. For example, Phipps claimed that agricultural educators are pragmatists; emphasize learning by doing; emphasize individual self-awareness, work-awareness, and career decision-making; believe in the importance of leadership and citizenship development; learn how to work with people who are disadvantaged and handicapped; advocate the use of problem solving as a way of encouraging thinking; and believe in community and community service. (p. 276)

Love (1978) described agriculture teachers as pragmatists and experientially oriented which allows them to see the real world according to experiences of the senses and problem solving as the best way to equip students for the future.

Arrington (1985) reported that females and minorities were underrepresented and Dyer and Osborne, in their synthesis of SAE, reported a great deal of variation in student participation

between states and dependence to some extent on demographics (Retallick & Martin, 2008).

Bobbitt (1986) found rural teachers placing more emphasis on the SAE and that age and years of experience of the teacher, also effected the emphasis and types of project. A key component to the successful implementation of the SAE program lies in teacher attitudes and expectations along with adaptability to the change from traditional to non-traditional areas of concentration (Thies & Terry, 2006).

Legislation

The Carl Perkins Act of 1984, passed by President Ronald Reagan, reaffirmed the federal commitment to vocational education through improving the labor force and job preparedness, while providing equal opportunities in vocational education. The Carl Perkins Act also served to link the student organizations such as Future Farmers of America (FFA), Future Business Leaders of America (FBLA), Vocational Industrial Clubs of America (VICA), and Future Homemakers of America (FHA), to the respective instructional program. This established the intra-curricular significance of these organizations.

This was followed by the Americans with Disabilities Act of 1986 which provided equal opportunities along with accessibility to individuals with disabilities. In the late 1980's agriculture education experienced a renaissance as it expanded its objectives with innovative programs and curriculum designs. A significant movement toward establishing agricultural education programs in urban schools and the emergence of agricultural academies was a product of these federal initiatives.

The Carl Perkins Act was amended in 1990 to provide the largest amount of funding ever for vocational education. The next legislation to directly impact agriculture education was the Goals 2000: Educate America Act of 1994, which was designed to be a blueprint for improving education. Following this legislation was the School to Work Opportunities Act of 1994, that emphasized the importance of school and industry partnerships which directly impacted agriculture education. The Carl Perkins Act was amended again in 1998 to emphasize federal support in high quality programs that integrated academics, promoted more rigorous standards for students, and developed linkage between secondary and post-secondary education. The 1990's saw an increased focus on core academics and declining recognition of the importance of vocational education toward student learning and development. As a result vocational programs became more technical and focused extensively on integrating core academics. The National Council for Agricultural Education developed a strategic plan for strengthening agricultural education known as Reinventing Agricultural Education for the year 2020 *(*RAE 2020) by establishing contemporary vision and mission statements. Funded through the Kellogg Foundation this initiative set out to increase the supply of teachers, provide greater student access, and develop alliances or partnerships (Phipps, Osborne, Dyer, & Ball, 2008).

Then the Elementary and Secondary Education Act of 2001 (No Child Left Behind) which placed the utmost importance on AYP (adequate yearly progress) based on annual report cards and mandates level of performance and accountability for all schools. The No Child Left Behind had far reaching impact on agriculture education because it changes education policy, accountability, and teacher quality. No Child Left Behind was the basis for the pathway approach

to agriculture education and the subsequent basis for end of pathway testing (Phipps, Osborne, Dyer, & Ball, 2008).The long range implications are still being determined.

Constructivist/ Behaviorist Learning Theories

Tradition dictates a strong relationship to the behaviorist teaching methods that dominate our agriculture education programs and that while firmly rooted in the past, is still utilized in the present. The constructivist approach is here to stay. The current student must be prepared for an ever-changing job market and world and Constructivism is the ideology that is best suited for this cause. Today's student is totally adept with far ranging communication skills and technologies, so they are quite capable of acquisition and utilizing these broad ranging concepts. In agriculture education, problem-solving has long emphasized the importance of personal relevance in learning (Hammonds & Lamar, 1968). The farm project identified in the Smith-Hughes Act was designed to demonstrate a real world setting and relevance to support classroom instruction (Camp, 1982). Prensky (2001) stated it best in that "these digital natives have lost touch with the traditional pedagogical methods of instruction such as lecture, reading passages, along with paper and pencil tasks. Today's students are no longer the people our educational system was designed to teach" (p. 1). Today's students are more adept at using cellular phones, compact disc players, computers, and video games because they have spent so much of their lives exposed to this technology (McAlister, 2009). Based on this trend in education the constructivist approach is the best option for meeting these unique needs.

The great pedagogical debate of behaviorism vs. constructivism will likely continue for quite a while. This ideological struggle between two teaching methods is based on the works of

several great educational leaders. For constructivism there is the work of John Dewey (1938) and the Swiss psychologist Jean Piaget (1959) and his book, "Language and Thought of a Child". Constructivists emphasize learning through natural peer group social interactions. This practice of brain-based learning includes multi-sensory learning styles, discovery learning, inquiry methods, and authentic learning environments.

For behaviorists there is the empirical research of Watson and B.F. Skinner, characterized in "Behavior of the Organism" (1938) and "Science and Human Behavior" (1953), along with the works of Mager, and others. The early theoretical framework for career technical education was based on the works of David Snedden, and Charles Prosser with little thought of application of learning theory (Camp & Hillison, 1983: Doty & Wiessman, 1984). From 1910 to 1920 the U.S. educational community was polarized by the ongoing debates between Snedden and Dewey (Wirth,1972). Behaviorism was the primary theoretical foundations of the social efficiency doctrine at the time of the Smith-Hughes Act (Camp, 1983). The competency based approach to teaching, with checklists for completion are deeply rooted in our career technical curriculum

The concept that learners construct their own knowledge from experience is termed constructivism (Fosnot, 1996). Constructivist processes were supported by the works of a Russian psychologist Lev Vygotsk's book "Thought and Language". Susan Path's book "Parallel Paths to Constructivism, Jean Piget and Lev Vygotsky", 2004, seemed to confirm the supporting evidence for constructivism. Recent educational reform efforts by the National Council of Teachers of Mathematics (1989, 1991), The National Academy of Science (1996), and the National Council for the Social Studies (1994) have all embraced constructivist principles within their theoretical frameworks. In addition, recent research concerning career and technical

education has discussed the usefulness of constructivist principles without specifically positioning those principles within the framework of a constructivist perspective (Cash, Behrmann, Stadt, & Daniels, 1998).

The National Education Association identifies several, "Current Best Practices", in the article Research Spotlight on the Best Practices in Education. Some practices that lend themselves well to agriculture education include; personalized learning, community connected, student learning groups, project-based/inquiry-based learning, integrated/interdisciplinary learning, and applied learning. These practices are geared toward today's student, that thrives on current innovations in educational delivery. Agriculture education offers an exceptional setting for the active approach to learning, with a strong emphasis on student interaction with various phenomena. There are various opportunities encourage the students open-mindedness, imagination and use of deductive reasoning. Agriculture education allows us to eliminate discipline boundaries and to link concepts and learning to other disciplines. Applied or hands-on learning are easily applicable to this concept. Cooperative group learning exercises easily suit the curriculum and may be utilized in the inquiry lab setting. The one area that can most apply in the concepts of Best Practices would be the integration of academics and career-tech education.

Experiential Learning

The foundation of the Supervised Agricultural Experience (SAE) project of the agriculture education program traces back to experiential learning of ancient Greece. Experiential education is in reality the first approach to learning. The concept of experiential education, otherwise known as learning by doing, has a long, well documented rich history.

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Experiential education is any form of teaching that utilizes direct hands-on experience to reinforce the topic or subject. Adkins, Carol-Simmons, and Bora (2003) noted that the value of experience as a tool in the creation of knowledge and the fostering of human development can be traced back to the early Fourth Century B.C. According to Aristotle "Their using the language of knowledge is no proof that they possess it" (p.3). By this statement, Aristotle is stating that theory is not understood until a person has the ability to apply it (Adkins, Carol - Simmons, & Bora, 2003).

Experiential learning is an educational strategy that connects classroom theory with practice in the real world. Adkins, Carol - Simmons, and Bora, (2003) noted when education is said to be experiential, it means that it is structured in a way that allows the learner to explore the phenomenon under study, to form a direct relationship with the subject matter, rather than merely reading about the phenomenon or encountering it indirectly. Experiential learning, then, necessitates the learner play an active role in the experience, and that the experience is followed by reflection as a method for processing, understanding, and making sense of the subject. Most often experiential education occurs in different types of programs that have as their goal the construction of knowledge, skills, and dispositions from direct experience is a key component. Service learning, adventure education, outdoor and environmental education, and workplace internships are just a few examples (Beard, 2002).

The apprenticeship system is additional historical aspect of experiential learning first developed in the later middle ages. Apprenticeship is a system of training a new generation of practitioners of a structured competency a basic set of skills. Back in the middle ages, master craftsman were entitled to employ young people as an inexpensive form of labor in exchange for

providing food, lodging and formal training in the craft. This type of exchange and low labor

cost is apprenticeship. Today the modern concept of an internship is similar to the early

beginnings of an apprenticeship. Work experience is a concept rooted in experiential learning. In

the work experience model, person gains experience while working in a specific field or

occupation, however, the expression is widely used to mean a type of volunteer work that is

commonly intended for young people, to get a feel for working environments. The American

equivalent term is internship (Wolf, 2011).

The birth of modern day experiential learning can be traced to the turn of the Twentieth

Century. John Dewey documented that learning is a process where students gain insights from

their experiences. Primarily John Dewey's work is responsible for identifying through

experiences individuals are able to establish a strong foundation for formal education. Dewey

believed students should be involved in real-life tasks and challenges. He challenged educators in

the 1910's, 20's, and 30's to develop educational programs that would not be isolated real life

experiences. John Dewey (1859–1952), perhaps the most prominent American philosopher of the

early Twentieth Century, expanded on the relationship between experience and learning in the

publication of his well-known book *Experience and Education* (1938).

In the 1960's and 70's there was a boom in the work of many psychologists, sociologists,

and educators who believed in the value of experience not necessarily as a replacement to theory

and lecture but as an addition to experience. Researchers and theorists in support of this concept

include Piaget, Chickering, Tumin, Bloom, Friere, Gardner, and Lewin (Adkins, Carol -

Simmons, & Bora, 2003).

While Dewey is credited with the development of modern day experiential learning, there were several others who played significant roles in advancing these learning concepts. These included Hahn, Kant, Lewin, Parker, and Montessori who each made a significant impact on the progression of experiential learning. One of the foremost experiential educators in the twentieth century was Kurt Hahn. Hahn believed the entire school day, including curricula, daily routines, social life, and extracurricular activities, could be used to support young people in development of social responsibility and high aspirations. Most important, it could also provide education and practice in the fundamental principles of democratic life (James, 1990). Another German philosopher, Immanuel Kant explained that that both rationality and experience have a place in the construction of knowledge. In truth, the human mind imposes order on the experience of the world and the process of perceiving it. Therefore, all experiences are organized and arranged by the actively structuring mind (Bader, 2008).

The work of field theorist Kurt Lewin, Jean Piaget genetic epistemologist, and educator and activist Paulo Freire also provided theoretical grounding for experiential education and were considered pioneers in the experiential learning movement. Another key contributor during this time was Francis Wayland Parker a pioneer of the progressive school movement in the United States. Parker believed that education should include the complete development of an individual, mental, physical, and moral. John Dewey called him the "father of progressive education." He worked to create curriculum that centered on the whole child and a strong language background (James, 1990). Also Carl Rogers contended that significant learning result's in a more mature self who is open to experience, to new people, "new situations, and new problems. Rogers (2013) presented his full theory of experiential learning. He believed that the highest levels of

significant learning included personal involvement at both the affective and cognitive levels, were self-initiated, were so pervasive they could change attitudes, behavior, and in some cases, even the personality of the learner (Kolb, 1994).

Maria Montessori emphasizes the value of experiential learning to conditionalize knowledge: Montessori advocates a learning process which allows a student to experience an environment first-hand; thereby, giving the student reliable, trust-worthy knowledge (Montessori, 1946). Kurt Lewin developed a psychological equation of behavior in which he states that behavior is a function of the person in their environment (Sansone, Morf, & Panter, 2008).

As to the applications of experiential learning to agriculture education there were several key leaders. Seaman A. Knapp is known as the father of Agricultural Extension Education. His philosophy, "what a man hears, he may doubt; what he sees, he may also doubt, but what he does, he cannot doubt" (Kolb, 1994, p. 25). Learning by doing was a guiding principle Knapp used in solving agricultural problems through his demonstration work. Rufus W. Stimson was a leader in shaping agricultural education at the high school level. He was the father of the project method of teaching, which is currently known as SAE projects in agricultural education (Moore, 1988). "Neither skill nor business ability can be learned from books alone, nor merely from observation of the work and management of others. Both require active participation, during the learning period, in productive farming operations of real economic or commercial importance" (Knobloch, 2003, p.28). Stimson's pillar of experiential learning represents learning through projects (Stimson, 1919). Stimson was behind the experiential learning component as it was applied to agriculture education and subsequently the S.A.E. program.

David A. Kolb (1984) published Experiential Learning: Experience as the Source of Learning and Development, which outlines a cycle for reflection. The cycle begins with concrete experience, moves to reflective observation, then to abstract conceptualization, and finally to the application stage, active experimentation. Reflection typically includes reconstructing the experience, making connections to prior knowledge or skills, testing understanding, and making decisions about how to apply the knowledge or skills in a new situation. William H. Lancelot's work, as a Professor of Vocational Education at Iowa State University, conceptualized Dewey's concept of contextual learning and created the problem solving method of instruction in agricultural education. His notable book, Permanent Learning, was "designed to produce teachers who are concerned with experiential learning (Knobloch, 2003).

The works of Dewey, Knapp, Stimson, and Lancelot have been studied and experiential learning has been authenticated as being a relevant and effective framework for agriculture education teacher preparation programs, high school agricultural education programs, teachers, and students. (Knobloch, 2003).

History of the Supervised Agricultural Experience

While the concept of experiential learning precedes the Smith-Hughes Act of 1917 and had long been a key component of secondary agriculture education programs, this landmark legislation contained language which required that students have directed or supervised practice in agriculture in which classroom skills were applied to real life situations (Stewart & Birkenholz,1991). The act specified:

…..that the controlling purpose of such education….be designed to meet the needs of

persons over fourteen years of age who have entered or are preparing to enter upon the

work of the farmer or of the farm home…that such schools shall provide for directed or

supervised practice in agriculture, either on a farm provided for by the school or other

farm, for at least six months per year (Phipps, 1980, p. 594).

According to Thies, and Terry (2005), the Smith-Hughes Act, which formalized

Vocational Agriculture programs, required that the farm projects be an integral part of all

agricultural education programs. The supervised farming concept was dominant until the passage

of the Vocational Act of 1963 which stated that funds may be applied to vocational education in

any occupation involving knowledge and skills in agricultural subjects and was not limited to on-

farm supervised practice.

The SAE component establishes the independent, work-based instruction that is best

described in the four lines of the FFA motto which are: "Learning to Do, Doing to Learn,

Earning to Live, Living to Serve," (Hirschy, Kreigh, Mdunke, 2012. p.19). The SAE is the

connecting link to the other components and serves to join them to a common goal of developing

the student for lifelong career success.

The basis of the SAE program is to develop a relationship between the student, the

agriculture teacher, the parents, and in some instances an employer, in the selection, conducting

and supervision of the individual student project. According to Dyer and Osborne (1996) the

early farm project has evolved into the current SAE program. The project will fit one of the

following categories; entrepreneurship, where the student operates a business; placement, which

involves a job or internship; research, involves an experiment; and exploratory, which involves

career studies (National FFA Organization, n. d.). Today's agricultural educators are faced with the continuous challenge of re-examining the structure and curriculum of Agriculture Education, of which SAE forms a major component (Camp, Clarke, & Fallon, 2000). Prior to 2001, the SAE program was divided into two major categories which were based on the National FFA Organization's recognition program for outstanding accomplishments. The two categories were Ownership/Entrepreneurship and Placement (Thies & Terry, 2005).

The ownership/entrepreneurship category traces back to the farm project concept and involve students planning, owning, and operating an agriculture enterprise, such as a crop, livestock, or an agricultural business (both on-farm and off-farm) settings. Students are financially involved and own all or a portion of the business thus making it an at-risk investment for the student. Ownership SAE programs often include livestock, field crops, vegetables, fruits, nursery crops, bedding plants or even specialty animals. Non-farm entrepreneurship projects are also ownership oriented either individually or group owned and should have a profit motive. Examples include a landscaping firm, custom work business, or a small engine repair shop. Such enterprises present considerable risk to the student and require a higher degree of supervision in the initiation, planning, and managing of the project (Phipps, Osborne, & Dyer, 2008).

The placement SAE, may be located either off-campus in an agricultural production setting, in an agricultural business or industry, or in some cases the school laboratory. In placement projects the student works for someone else either for pay or experience outside of normal classroom hours. As the availability of production agriculture facilities dwindles there is an increasing demand for placement SAE projects. Placement SAE projects are most appropriate

and beneficial to students with limited opportunities for SAE's requiring ownership (Phipps, Osborne, & Dyer, 2008).

In recent years, SAE programs have expanded considerably and teachers have become more creative and flexible in helping students select and design their individual projects (Phipps, Osborne, & Dyer, 2008). In addition to the Entrepreneurship/Ownership and Placement SAE projects the National FFA Organization (2010) currently recognizes two additional types of projects. The current SAE categories include Exploratory and Research/Experimentation and Analysis which prior to 2001 had only been recognized through the Agriscience Fair (Thies, 2005).

Exploratory SAE's are designed to help students learn about agriculture and related career opportunities. Students selecting the Exploratory SAE option have the goal of learning about the agricultural area of choice and to utilize this information for identifying a career path (Phipps, Osborne, & Dyer, 2008). Thies (2005) describes Exploratory SAE as students learning about the "big picture" of agriculture, thus enabling them to become literate in agriculture and its many related careers. Exploratory SAE projects may employ a mixed approach that includes some elements of placement, ownership, and/or research projects (Phipps, Osborne, & Dyer, 2008).

Research/ Experimentation and Analysis SAE projects provide students with an opportunity to conduct research, or analyze information to discover new knowledge using the scientific process, and to evaluate data to compile a scientific paper (Thies, 2005). Phipps, Osborne, and Dyer (2008) explained that though the Research SAE is particularly suited to programs with a strong emphasis on agriscience, students from the more traditional programs

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may benefit by providing students with career goals in areas of agriscience with valuable learning experiences.

The categories of Supervised Agricultural Experience (SAE) must be as fluid as the agriculture subject matter. Alternatives to accepted categories of SAE could open up new avenues and non-traditional projects that still meet the definition of SAE, but do not fit into existing categories. Steele (1997) explains as follows:

> The major categories of SAE are supported by the School-to-Work Opportunities Act of 1994. The 1994 Act required that school-to-work opportunities be planned, supervised, and have some educational purpose, and help students obtain skills leading to a career (p. 51).

However as the agriculture industry changes and more non-traditional students enroll in agriculture classes, SAE must adapt to meet the needs of a new clientele. As the agriculture curriculum evolves to meet the needs of a changing society the variety of categories of SAE will need to develop.

Benefits of the SAE

For any experience to be effective the student must believe that they will be getting something beneficial out of the experience. Pals (1988) identified the five greatest student perceived benefits of SAEs. These benefits were (1) an opportunity to learn on their own, (2) acceptance of responsibility, (3) develop independence, (4) pride of ownership, and (5) learning to appreciate work.

Phipps, Osborne, Dyer and Ball (2008) recognized that "SAE programs can fill a significant void in the application and transfer of acquired knowledge and skills, and often aid in developing positive attitudes toward learning. In short, SAE programs, bridge the gap, between theory and experience," (p. 445). Robinson and Haynes (2011) explained that:

> Agriculture teachers value the fact that (SAE) programs prepare students for possible careers and for life beyond high school. Teachers also expect students to learn responsibility, accountability, and work ethics as through conducting SAE projects. The support of the agriculture teacher is critical to the success of the SAE program, so the value and expectations that the teacher places in the program directly affects the success of this aspect of the agricultural model (p. 1-2).

Rawls (1982) reported that parents recognized the benefits of SAEs to be in the areas of work attitude, occupational development, and human relations (p.31). Students are able to gain real world, hands-on experience while completing their SAE, also known as experiential learning project. The SAE project offers real life experiences to students that help reinforce material taught in the classroom (Camp, Clark & Fallon, 2000; Randell, Arrington & Cheek, 1993). The SAE serves as the foundation on which vocational education is based, learning by doing (Camp, Clark & Fallon, 2000). John Dewey's model of experiential learning focuses on "integrating experience and concepts, observations and action" (Kolb, 1984, p. 22).

The SAE project encourages students to learn more in class since it becomes more applicable, creates energy and excitement through competition and involvement, and instills a sense of ownership and pride through agriculture field experience (Camp, Clark, & Fallon, 2000). Supervised agricultural experience programs are a way for students to take their personal

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interest, mix it with what they have learned in the classroom and laboratory, and learn in a "real life" scenario (Workman, 2010). SAE's provide students with the opportunity to achieve individual success and recognition while serving to develop lifelong skills and work habits.

Supervised Agricultural Experiences provide an opportunity for students to earn accolades and be rewarded for their hard work. These accolades help build confidence and fuel the student's motivation to achieve through degrees and proficiency awards (Workman, 2010). Student success in the SAE program can result in proficiency awards at local, area, state and national level. SAE participation is required for student advancement in the FFA degree program. SAE involvement connects various components and participants into a common result (Thies, p. 200).

The Supervised Agricultural Experience not only allows for student learning, but also helps to add economic input to the local community. These contributions can include investment in purchases of inventory (such as livestock and equipment), vehicle usage, and hotel rooms utilized for SAE related trips. Expense values translate into local and state business income, which encourages growth in jobs and the economy. Cole and Connell (1993) suggested a measure for determining economic value of SAE programs. In the midst of the current economic environments these long-range values to the community serve to justify the overall need for the program (McHugh, 2007).

Conceptual Framework

The early studies of SAEs were based on the educational benefits. Extensive evidence of the educational value of SAE exists in the literature; however, the value of SAEs from an

economic standpoint is less understood (Hanagriff, Murphy, Roberts, Briers, & Lindner, 2010). Beginning in 1985, the Western Region of the American Association of Teacher Educators in Agriculture (AAAE) conducted a series of impact studies to produce data to evaluate agricultural programs. Impact studies were considered to be a valuable part of the overall data used to evaluate secondary agriculture programs. However, there was little existing data and the data that was available focused on leadership and educational advancement as measures of progress, with no information on economic aspects (Cole & Connell, 1993). The Perkins Act required that states produce annual reports on their progress in planning and improving programs (Hays, 1985).

Cole and Connell (1993) conducted a study to measure the economic impact of the agricultural science and technology programs in Oregon. Data was collected on the teacher salaries as well as state, federal and grant monies that would not have come to the school had the agricultural program not existed (Direct Impact Data) and on money earned and spent by students in the community due to the requirements of agricultural science and technology program (Programmatic Impact Data). Using an Input-Output model with a median teacher salary of $31,500 and an average student spending /making $45,920 the combined economic impact on the local community was $245,022. This study provided an early glimpse into the magnitude of the economic impact of SAEs. Cole and Connell recommended conducting additional research using Cost/Benefit analysis to compare the cost associated with the educational program to economic benefits from the program. In addition, it was recommended that teachers collect this type of data and place it in a form suitable to report to school administration. Dyer and Osborne (1995) reported that, at least by the time of their research,

there had been no experimental research or empirical data on the benefits of SAEs. The lack of such data prevents the profession from promoting SAEs and identifying the necessary areas for change. Until the publication of papers by West and Iverson (1999) and Graham and Birkenholz (1999), little or no research data was available.

West and Iverson (1999) evaluated 174 agricultural education programs and determined that the local economic impact per SAE program in Georgia was $71,344. Additionally, they extrapolated an overall economic impact of more than $12 million to the State of Georgia. West and Iverson suggested that research continue into the economic impact of SAEs due to the continual changes in agriculture programs.

Graham and Birkenholz (1999) collected data in Missouri from 1988 to 1997 to analyze the changes in students labor income derived from SAEs. SAE income for this period doubled in the ten year period. By utilizing the Consumer Price Index (CPI) this accounted for an increase to $31.8 million dollars, providing additional evidence of the impact that SAEs have on the local community.

Retallick and Martin (2005) conducted a study that focused on the income derived from the placement SAEs in Iowa. The purpose of this study was to identify the economic impact of the SAE in Iowa. The average per student earning from a placement SAE was $1443 per year. The Iowa total SAE income for 2001 was $18.6 million. The results of this study show substantial economic impact which has grown consistently over the 11 year period. The study emphasized the economic impact of SAEs in Iowa. Retallick and Martin suggest all states collect SAE data as a measure of accountability.

Hanagriff, R., Murphy, T., Roberts, T., Briers, G., and Lindner, J. (2010) conducted an economic impact of SAE survey for Texas the results of which indicated $189 million in total economic value from SAE related spending. A survey was sent to 1426 teachers in Texas asking about the types of SAE projects in their program and the investment costs per project. The most prevalent SAE projects for Texas were market sheep, market goats, market swine and market beef projects. Texas chapters responding to the survey indicated an average amount of travel related expenses was $412,654. Texas chapters on average had a total investment cost in SAEs of $90,222. Texas chapters had an average total investment value for all SAE projects and related travel of $105,877. The Impact Analysis for Planning (IMPLAN) factor was utilized to determine the overall effect of the direct input into the Texas economy of SAE projects. IMPLAN is a method to measure economic value through utilizing an input-output database and modeling system that produces multiplier values from the economic models to estimate the spending on a region's economy (Mulkey & Hodges, 2003). The result was $189 million being returned to the state as a result of the SAE projects. Improved assessment of SAE programs will provide solid evidence in support of continued investment. Hanagriff, Murphy, Roberts, and Lindner, (2010) suggested that the actual cost of each student's SAE projects from a student perspective remains difficult to determine and is a limitation of your study and that research relating to the investment cost of student SAEs is largely unknown and this study provides a methodology and estimation of value. A statewide, or perhaps national, system should be developed to track SAE investment, expenditures, and receipts from the students themselves. FFA record books and software are potential tools, but sometimes lack consistency in the way

these values are collected and lack of distribution to all students enrolled in agriculture education.

Harder and Hodges (2011) introduced the idea of using IMPLAN, a software program that can be used to estimate economic impacts, to evaluate the impact of 4-H livestock projects. An IMPLAN analysis starts with the measurement of direct spending. Direct spending for FFA or 4-H youth livestock projects typically includes expenditures such as purchase of animals, feed, housing, veterinary expenses, and equipment. This direct spending causes more money to be spent by vendors. For example, a shop owner who sells feed to an FFA or 4-H member can then use the profits from the sale to pay an electric bill or an employee or invest in additional inventory. These actions have a positive effect on the economy that is described as the total economic impact. Harder and Hodges (2011) explained how IMPLAN results could help agents and educators in their efforts to justify continued public support.

Marcouiller, Ray, Schriener, and Lewis, (1992) outlined a technique to estimate regional economic impacts of production-oriented extension programs using the IMPLAN system. The analysis described in this study rests on the assumption that extension programming directly affects commodity production. Analysis based on changes in raw material supplies is an effective way to estimate the impacts of production-oriented extension programming on regional employment and income.

Theoretical Framework

One method to determine the economic value of the SAE in a local community is the Impact Analysis for Planning (IMPLAN), which produces multiplier values from economic

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models to estimate the economic impacts of spending on a region's economy (Mulkey & Hodges, 2003). The theoretical basis for an analysis of this nature traces back to Leontief's (1970) Input Output Analysis or Model. The Input-output model is a way of representing the interdependence between the various sectors of the economy. This theoretical framework also addresses the recommendations of Cole and Connell (1993), who suggested a Cost/Benefit approach to measuring programmatic value.

This model was created in 1993 by a University of Minnesota research team that originally used the model to measure the economic impact of the forestry industry, but now is a product of MIG, Inc. Using classic input-output analysis in combination with regional specific Social Accounting Matrices and Multiplier Models, IMPLAN provides a highly accurate and adaptable model for its users. The IMPLAN database contains county, state, zip code, and federal economic statistics which are specialized by region, not estimated from national averages and can be used to measure the effect on a regional or local economy of a given change or event in the economy's activity (Minnesota IMPLAN Group Inc. 2009).

There are many levels of IMPLAN economic impact. According to Mulkey and Hodges (2003), Type II economic value is a commonly used estimate that includes values of consumable spending, salaries and use of raw materials used in manufacturing. Previous studies have utilized a theoretical framework of using placement SAE income or teacher salary as values, but a new framework would be to consider the costs of entrepreneurship SAEs since they are an educational focus and have common types across all chapters.

Economic benefits are calculated following the IMPLAN Model for economic value, which is a set of multiplier values derived from spending within certain sectors. This model is

utilized in business, education and tourism by identifying economic benefits from spending money in a certain sector. IMPLAN can create a localized model to investigate the consequences of projected economic transactions in your geographic region. Used by over 2,000 public and private institutions, IMPLAN is the most widely employed and accepted regional economic analysis software for predicting economic impacts. IMPLAN is an Input/output (I/O) modeling system that is maintained by MIG, Inc., which is located in Hudson, Wisconsin. An I/O model is based on the theory that when new money enters a community through investment, revenues or income, some of it is re-spent one or more times in the local economy, thereby creating an economic impact that is most often measured in terms of employment, income or output. IMPLAN estimates these impacts using specific data on what inputs are needed to produce the products or services for some 440 industries (Mulkey & Hodges, 2000).

According to the direct economic impacts identified, IMPLAN can calculate the indirect and induced impacts based on a set of multipliers and additional factors. Another major advantage of IMPLAN is its credibility and acceptance within the profession. There are over five hundred active users of IMPLAN databases and software within the federal and state governments, universities, and among private sector consultants. IMPLAN economic benefits have several levels of multipliers, but the most comprehensive and conservative is the Type II multiplier value. The economic values of student spending to complete entrepreneurship SAE projects are $1.80 and additional travel values associated to SAEs are $2.09 (Hanagriff, Murphy, Roberts, Briers, & Lindner,(2010).

Summary

Agriculture education first became a part of the public education system in 1917 when the U.S. Congress passed the Smith Hughes Act. Today over 800,000 students participate in formal agricultural education programs offered in all 50 states and 3 U.S. territories" (National FFA Organization, 2011.) Supervised agricultural experiences having been a key educational component throughout the historical development of agriculture education the steady rise in agricultural education enrollments should translate to a proportionate increase in the quantity of SAE projects.

Supervised Agricultural Experience projects are an essential component of the comprehensive secondary agriculture program. SAE participation is necessary for advancement in the FFA degree program and to enhance the classroom learning component through hands-on, work-based, individualized application. Newcomb, McCracken, Warmbrod, and Whittington (2004) noted that SAEs allow students to apply the practices and principles learned in the classroom and develop new skills and abilities while being involved in these projects. Likewise, Newcomb et al. (2004) concluded that supervised experiences also improve learning, student personal development, and occupational development.

Chapter 3

Methodology

Introduction

The purpose of this study was to determine the economic impact of high school agriculture students, supervised agricultural experience programs, from a national and a regional viewpoint. The structure and format of the study was replicated from the Hanagriff (2010) study, completed in Texas in 2007-2008. This research measured quantitatively the value of SAEs to the students' local community economy on a nationwide basis and compares the value between the various geographic regions of the country (Appendix 1). This quantitative data is beneficial to stakeholders on all levels in order to demonstrate the economic benefits for agriculture programs and overall accountability to support the program. As stakeholders seek resources for making decisions regarding educational funding during these difficult economic times, this data will serve as a valuable tool for justifying the long range value of agriculture programs to the local communities (McHugh, 2010).

Research Questions

The following research questions were used to guide this study:

1. Which types of SAE project produce the most economic impact?

2. What is the estimated economic impact, on a per-school basis, for students that

are enrolled in Agriculture Education?

        3. What is the estimated economic impact, for SAE projects nationally?

        4. How will the economic impact of SAE's compare on a regional basis (NAAE geographic regions I, II, III, IV)?

        5. Could a predictive model to determine economic impact be developed?

Null Hypothesis

There is no statistically significant difference in predictors. No predictor variable or combination of variables will account for a statistically significant portion of the variance in economic impact of SAEs.

Research Design

The survey instrument included questions regarding demographics, the specific state represented in the response, number of years teaching experience, school size and classification, agricultural education program student enrollment and FFA membership. Following the demographic questions, the instrument asked respondents to identify and describe the SAE projects within their programs from a list of common SAE projects, and requested that they be listed as placement or entrepreneurship projects. The remainder of the survey asked the respondents to describe the SAEs within their program. For each SAE area the respondent were asked to; estimate the average expense to raise one unit of the SAE, the total number of each project in their chapter during a 12 month period, and the total number of students in the chapter with the SAE projects.

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The National FFA recognizes specific SAE categories through Agricultural Proficiency Awards, which honor FFA members for SAE performance. Proficiency awards are given out at the local, state and national levels for performance in SAEs. Students can compete for awards in 49 areas, ranging from Agricultural Communications to Wildlife Management. Each award area has two categories, placement and entrepreneurship. Placement proficiency awards are awarded to participants that their SAE is related to employment, apprenticeships, or internships at an agribusiness or agriculture-related organization. Entrepreneurship proficiency awards are awarded to the student in which the SAE is related to ownership of an agribusiness or agriculture-related organization.

To measure size and value of each SAE area, teachers identified the numbers of students involved in each area and the typical cost invested to complete each project area. The list of projects included major areas that involved common unit of measure values, such as head, acre, or pen. Respondents were asked to estimate their annual miles associated with related FFA activities, as well as their annual hotel room usage. This study used the teacher's perceived value of cost for each SAE, as the most informed person involved with SAEs, since they provide estimates of cost to parents with students involved in the program and review student's record books in preparation for FFA awards. The calculation of economic benefits utilized IMPLAN, a computer software package that consists of procedures for estimating local input-output models and associated databases. The acronym IMPLAN is for Impact Analyses and Planning. IMPLAN was originally developed by the U.S. Forest Service in cooperation with the Federal Emergency Management Agency and the U.S. Department of the Interior's Bureau of Land Management to assist in land and resource management planning

(Mulkey & Hodges, 2008). This model has been utilized in business, education and tourism by identifying economic benefits from spending money in a certain sector. IMPLAN economic benefits have several levels of multipliers, but the most comprehensive and conservative is the Type II multiplier value (Hanagriff , 2010). As a replicated study the IMPLAN values utilized by Hanagriff (2010), were calculated at $1.80 for agriculture expenditures and $2.09 for travel cost. This would indicate that an additional spending of $1.00 in the agriculture industry or travel industry would result in a total change in local output of $1.80 for agriculture and $2.09 for travel related values.

A standard multiple regression was completed to address the research question asking could a predictive model to determine economic impact be developed. The standard multiple regression, through the standardized beta weights, addressed the research question to which of the seven predictors; years of experience, region of the nation, number of teachers in program, size of the school, number of students, number of FFA members, and use of record books, carries more weight in the prediction of the total economic impact of SAEs.

Population and Sample

The population for this study consisted of agriculture education teachers from across the nation and the data for the study will be based on their perceptions. All 5,970 members of the National Association of Agriculture Educators (NAAE) were asked to participate in the study. The NAAE is a federation of 50 state agricultural educators associations. The National Association of Agricultural Educators (NAAE) in cooperation with Purdue University has developed an electronic mail list-serve for use by agricultural education teachers, state staff,

teacher educators, and others interested in agricultural education (National Association of Agricultural Educators, 2013). The list-serve allows someone to send one message to the list-serve and have that message forwarded on to all subscribers to the list. It has capabilities to send text messages and attached files allowing interaction with the various members. Through the utilization of the list-serve a wide range of participants may be readily reached. Initially an introductory email was sent, explaining the nature and significance of the study. The initial e-mail was sent to all NAAE member educators, following Dillman (2000), recommendations and included a link to the survey which was available on Qualtrics. Qualtrics is an on-line survey instrument designed to collect and analyze data. Respondents were asked to return one survey per chapter and the chapter FFA number was used as a control value. Responses were grouped by state and region for data analysis. Teachers were asked to respond within a two week time period. Additionally survey requests were emailed utilizing NAAE directories with every fourth member receiving a survey request. Following the initial request two reminder emails were sent on a two week interval.

On November 15, 2013 the initial email requesting participation was posted on the list-serve. After two weeks there were 137 responses recorded. In an effort to increase participation every 4th person on the email listings received the request in order to stimulate additional response. The result was 1950 individual requests followed by the 2nd posting on the list-serve which yielded an additional 161 responses. Since the participants were active teachers and the list-serve was primarily through school addresses the two week holiday period was excluded so the final request was sent on January 6, 2014. Soon after this period began many prospective participants noticed software conflicts with the Qualtrics survey link. Re-sending the

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introductory letter corrected some, providing a total of 362 completed documents. The remaining 12 were downloaded and handwritten at the request of participants and manually entered.

Institutional Board Review

According to federal regulations and Auburn University policy an IRB review is required for all research studies involving human subjects which must be submitted and approved. This is required to protect the rights of the participants (Appendix 2).

Instrumentation

For this study, Qualtrics an on-line survey instrument designed to collect and analyze data was utilized. A combination of close-ended (Likert type) questions and a group of partial close-ended questions were utilized. The survey instrument included demographic information, a list of placement and entrepreneurship projects. Respondents were asked to begin the survey by replying to questions regarding demographics, years of teaching experience, school size classification, agriculture education program student enrollment numbers and FFA membership. Following the demographic questions, respondents were asked to estimate their annual travel miles in program vehicles and their annual hotel room usage. The remainder of the survey asked respondents to describe their SAE programs within their programs.

Salant and Dillman (1994) noted that response options should be limited to less than five choices and a series of questions should be used to address complex and abstract issues. Closed-ended questions may also be categorized as: (a) questions that describe and evaluate people, places, and events; (b) questions that measure responses to ideas, analyses, and proposals; and

(c) questions that measure knowledge. Close-ended questions should be limited to less than five choices. The choices form a continuum of responses, such as those provided by the Likert scales and numerical ranges. The survey utilized Likert-type scales for questions where quantitative data were needed. These types of questions were easiest for respondents to answer and researchers to analyze the data. Multiple choice questions are an example of this type. The researcher must ensure that the respondent is given a comprehensive selection of responses. Closed-ended questions with unordered choices are useful for ranking items in order of preference. The closed-ended questions which the respondent is asked to compare possible responses and select one, or write in other seem to work best. Salant and Dillman (1994) observed that most respondents choose one of the given responses when this type of question is presented. Beliefs, attitudes, and behaviors are also often inadequately contemplated. Salant and Dillman (1994) suggested that researchers use a series of related questions to gauge beliefs, attitudes, and behaviors, and then examine the responses to identify patterns and consistencies in the answers. The survey should ask for specific recommendations to be accepted or rejected, or to rank the relative importance of competing interests.

Reliability

The survey instrument used in this study was replicated from a Texas SAE study conducted by Hanagriff, Murphy, Roberts, Briers and Lindner. Hanagriff et al. commented "the survey was distributed to a set of Texas agriscience teachers as well as director of agriculture at Texas Education Agency to review the survey and make recommendations to the format and questions" (p. 74). Instrument reliability was established by using 22 SAE involvement

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questions from the pilot study. These questions and responses resulted in a Cronbach's alpha value of .80, which established instrument reliability.

Validity

The survey instrument used replicated the instrument that was pilot–tested in 2006 by Texas agriculture teachers and reviewed by the director of agriculture at Texas Education Agency; they made recommendations to the format and questions (Hanagriff, Murphy, Roberts, Briers & Lindner, 2010). In 2010, the survey was formatted for Georgia agriculture programs, university instructors reviewed for any errors (McHugh, 2010). The survey instrument formatted for this study was submitted to university instructors for review.

Handling non-responses and threats to external validity followed the procedures identified by Lindner, Murphy, and Briers (2001). Lindner et al.(2001) recommended that if late respondents did not differ from early respondents, then the results could be extrapolated to the population. After the final email request's two week deadline a separate group of 18 participants that were identified as late responders. The 18 late responders were compared to the 366 early responders in the independent variables, years of experience, NAAE region, number of teachers in program, size of school, number of students, number of FFA members, use of record-books and economic impact. Because no significant differences were found (p = .11), the results will extrapolate to represent the total population of 5970 agriculture teachers (Hanagriff, Murphy, Roberts, Briers, & Lindner, 2010).

Data Analysis Plan

All 5970 members of the National Association of Agriculture Educators (NAAE) were asked to participate in the study. Following Dillman's (2000) recommendations an introductory e-mail explaining the study and identifying the significance was sent via list-serve to all members. Respondents were asked to return one survey per chapter. The initial e-mail included a link to the survey on Qualtrics. Qualtrics is an on-line survey instrument designed to collect and analyze data. Teachers were asked to respond within a two week time period. Each chapter was asked to send only one response and the national chapter FFA number was used to avoid duplication. Additionally survey requests were emailed utilizing NAAE directories with every fourth member receiving a survey request. An additional reminder e-mail was sent after two weeks. A final reminder email was sent after two additional weeks. The survey instrument will include demographic information, a list of placement and entrepreneurship projects. To measure size and value of each SAE area, teachers responded to the numbers of students involved in each area and the typical cost invested to complete each (Hanagriff, Murphy, Roberts, Briers & Lindner, 2010).

It is important to note, however, that surveys only provide estimates for the true population, not exact measurements (Salant & Dillman, 1994). According to Dillman (1994) the needed size S of a randomly chosen sample from a finite population of N cases such that the sample proportion p will be within $\pm$ .05 of the population proportion P with a 95% level of confidence. So based on these figures for the 5,970 NAAE members the sample size should be at least 284 respondents.

A standard multiple regression addressed the research question by asking could a predictive model to determine economic impact be developed. The standard multiple regression,

through the standardized beta weights, addressed the research question to which of the seven predictors; years of experience, region of the nation, number of teachers in program, size of the school, number of students, number of FFA members, and use of record books, carries more weight in the prediction of the total economic impact of SAE's.

Implications of the Study

The quantitative data from this study can be used to illustrate the economic benefits of agriculture programs and overall accountability. In the midst of current economic environments, this study will assist agricultural educators, school administrators, state supervisors, students, and the National FFA organization in validating educational funding. In addition, a goal of this study is justifying long-range value of agriculture programs to the local communities.

Chapter 4

Research Findings

Introduction

This study examined the economic impact of high school agriculture students' supervised agricultural experience programs, on a national and a regional perspective. The structure and format of the study is replicated from the Hanagriff (2010) study, completed in Texas in 2007-2008. This research measured quantitatively the value of SAEs to the students' local community and on a nationwide perspective and make a comparison of said value between the various geographic regions of the country. This quantitative data could be used to prove the economic benefits for agriculture programs and overall accountability to the various stakeholders involved in the supporting the program. With the state of the economy, in terms of educational funding, this could serve a valuable function for justifying long range value of agriculture programs to the local communities (McHugh, 2010).

The purpose of this study was to address the recommendation of Hanagriff, Murphy, Roberts, Briers, and Lindner (2010) to track Supervised Agricultural Experience investments, expenditures and receipts on a national and a regional basis. The structure and format of this study replicates the Hanagriff (2010) study, completed in Texas in 2007-2008. This research would be an attempt to produce a quantitative estimate of the value of SAE's to the students'

local economies on a nationwide basis and make a comparison of said value between the various geographic regions (NAAE regions I - VI) of the nation.

The calculation of economic benefits utilized IMPLAN, a computer software package that consists of procedures for estimating local input-output models and associated databases. This model is utilized in business, education and tourism by identifying economic benefits from spending money in a certain sector. IMPLAN economic benefits have several levels of multipliers, but the most comprehensive and conservative is the Type II multiplier value (Hanagriff , 2010). As a replicated study the IMPLAN values utilized by Hanagriff (2010), were calculated at $1.80 for agriculture expenditures and $2.09 for travel cost. This would indicate that an additional spending of $1.00 in the agriculture industry or travel industry would result in a total change in local output of $1.80 for agriculture and $2.09 for travel related values. This quantitative data can be used to prove the economic benefits for agriculture programs and overall accountability to the various stakeholders involved in supporting the program (Cole and Connell, 1993). With the state of the economy, in terms of educational funding, this could serve a valuable function for justifying long range value of agriculture programs to the local communities. Economic values of Agricultural Education need to be communicated to school administration, state leaders, and potential funding sources that support A gricultural Education (Hanagriff, 2010).

Research Questions

The following research questions were used to guide this study:

1. Which types of SAE projects produce the most economic impact?

2. What is the estimated economic impact, on a per-student basis, for students that were enrolled in Agriculture Education?

3. What is the estimated economic impact, for SAE projects nationally?

4. How will the economic impact of SAE's compare on a regional basis (NAAE geographic regions I - VI)?

5. Can a predictive model to determine Economic Impact be developed?

Null Hypothesis

There is no statistically significant difference in predictors. No predictor variable or combination of variables will account for a statistically significant portion of the variance in economic impact of SAEs.

General Description of Study's Participants

The population for this study consisted of agriculture education teachers from across the nation and the data for the study will be based on their perceptions. All 5970 members of the National Association of Agriculture Educators (NAAE) will be asked to participate in the study. The NAAE is a federation of 50 state agricultural educators associations. The National Association of Agricultural Educators (NAAE) in cooperation with Purdue University has developed an electronic mail list-serve for use by agricultural education teachers, state staff, teacher educators, and others interested in agricultural education (National Association of

Agricultural Educators, 2013). The list-serve allows someone to send one message to the list-serve and have that message forwarded on to all subscribers to the list. It has capabilities to send text messages and attached files allowing interaction with the various members. Through the utilization of the list-serve a wide range of participants may be readily reached. Data collection through the survey method seemed to be the best means of reaching out to membership of a national organization such as the NAAE. Isaac and Michael (1997), stated that survey research is used: "to answer questions that have been raised, to solve problems that have been posed or observed, to assess needs and set goals, to determine whether or not specific objectives have been met, to establish baselines against which future comparisons can be made, to analyze trends across time, and generally, to describe what exists, in what amount, and in what context".

On November 15, 2013 the initial email requesting participation was posted on the list-serve. After two weeks there were 137 responses recorded. In an effort to increase participation every fourth person on the email listings received the request in order to stimulate additional response. The result was 195 individual requests followed by the second posting on the list-serve which yielded an additional 161 responses. Since the participants were active teachers and the list-serve was primarily through school addresses the two week holiday period was excluded so the final request was sent on 1/06/2014. Soon after this period began many prospective participants noticed software conflicts with the Qualtrics survey link. Re-sending the introductory letter corrected some, providing a total of 362 completed documents. The remaining 12 were downloaded and handwritten at the request of participants and manually entered. The late responders were utilized in handling the non-responses and errors to external validity following the recommendations of Lindner, Murphy, and Briers (2001).

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There were 374 usable surveys included in the study. Participants consisted of 374 active agriculture teachers and represented all six NAAE regions of the nation (illustration 1). The regional distribution of the 374 participants consisted of 49 from region I, 46 from region II, 70 from region III, 43 from Region IV, 56 from Region V, 33 from region VI and 8 unidentified by region.

The initial questions on the survey instrument were designed to identify certain demographics of the respondents. Respondents were asked to reply to questions regarding; SAE involvement, years of experience, NAAE region of the nation, number of teachers in program, school size, number of agriculture students, number of FFA members, and student use of record books. The following tables will better identify the respondent and the agriculture program. First the categorical variables were identified from responses representing questions 1, 5, 6 & 7. The categorical variables included; level of SAE involvement, number of teachers in the program, NAAE region, and the size of the school. Table 1 depicts the level of involvement in the SAE program based on a frequency distribution of 96.4% based on an (n) of 340. That would indicate that more than 96% of the respondent's programs participated in SAEs.

Table 1

Respondents Agricultural Program's Level of Supervised Agricultural Involvement for 2013(n=376).

SAE Participation Options	Frequency	Percentage
Program was involved	340	92.9
Program was not involved because of lack of student interest	18	4.9
Program was not involved due to lack of school support	8	2.2
Missing	10	2.7
Total	376	100.0

Table 2 identifies the region of the country where the programs were located, based on the NAAE regional identity (Appendix 1). Results from this frequency analysis (N=354) indicated a uniform distribution with Region III having the larger frequency (84) and subsequent 22.3% while Region VI had the smallest frequency and subsequent 10.7% representation in the study.

Table 2

Regional Location of Respondent Based on NAAE Region (n=376).

Responses	NAAE Region	Frequency	Percentage
	Region I	57	16.1
	Region II	66	18.6
	Region III	84	23.7
	Region IV	52	14.7
	Region V	57	16.1
	Region VI	38	10.7
Missing		22	5.9
Total		376	100

Note: Refer to NAAE Region Map Appendix 1

Table 3 examines size of school for the respondents (N=354). The categorical distribution of schools was based on five possibilities ranging from very small with under 300 students to very large with over 2000 students. The resulting analysis suggests very small schools and large schools, with respective frequencies of 97 and 92 accounts for 25.8 and 24.5 percent of the distribution or over 50% of the total.

Table 3

Approximate Size of Respondents School (n=376).

School Size	Frequency	Percentage
Very Small: >300	97	26.5
Small: 300-599	80	21.3
Medium: 600-899	68	18.1
Large: 900-1999	92	25.1
Very Large:< 2000	29	7.7
Missing	10	2.7
Total	376	100

Note: Size based on student numbers.

An analysis of Table 4 which compares the frequency distribution associated with the number of teachers in the school program with 5 categorical responses identified in the instrument. The resulting frequency comparison indicates single teacher programs have a frequency of 232 of and represents 61.7 % of (N=354).

Table 4

Number of Agriculture Teachers in the Program

Number of Teachers in the Program	Frequency	Percentage of Total Number of Teachers
One	232	63.6
Two	78	20.7
Three	34	9.0
Four	13	3.6
Five	6	1.6
Over Five	2	.5
Total	N = 365	100.0

Additional demographic factors include; teacher's years of experience, number of agriculture students, number of FFA members, and number of students utilizing record books. These variables are continuous in nature and will be comparatively analyzed based on means, standard deviations, and ranges. Table 5 examines the analysis of the Q3 years of experience survey response. With (N=358) the respondent results indicated a mean (μ) of 14.50, a range of 41, and a standard deviation (σ) of 10.77 which suggests the respondents had about 14.5 years of experience and that the maximum experience of the respondents would be 41 years.

Table 5

Current Years of Experience for the Respondents

Number of Respondents	358
Average Years of Experience	14.5
Standard Deviation	10.77
Range of Experience in Years	0 to 41
Total Years of Experience for the Respondents	5191

The continuous variable, number of agriculture students in the program, Q8 is displayed

on Table 6. The mean (μ) value of 157.28, a range of 2495, and standard deviation (σ) of 169.94

for (N=361) indicates an average number of students per program at 157 with normality in the

distribution.

Table 6

Approximate Number of Agriculture students in the Responding Program (n=361).

Responses	Minimum Number	Maximum Number	Mean	Standard Deviation	Sum
361	7	2500	157.28	169.69	56,779

The number of FFA members per program, as identified by respondents in Q9, is

presented on Table 7. The distribution of this continuous variable is relatively normal. The mean

(μ) of 98.36, range of 604, and standard deviation (σ) 82.04 indicate an average FFA

enrollment of 98 members for each program.

Table 7

Approximate Number of FFA Members in the Responding Program (n=363).

Responses	Minimum Number	Maximum Number	Mean	Standard Deviation	Sum
363	6	610	98.36	82.04	35,705

Table 8 summarizes the respondents answers to Q10, as to how many students in the program completed an annual record book. The responses (N=355) for this continuous variable generated a mean (μ) of 74.1, a range of 1000, and a standard deviation (σ) of 113.92. These results indicate a positively skewed distribution with greater emphasis to the right of the model. A higher concentration of students did not use record books than those that did.

Table 8

Number of Students Completing an Annual Record Book (n=355).

Responses	Minimum Number	Maximum Number	Mean	Standard Deviation	Sum
355	0	1000	74.11	113.93	26309

Handling non-responses and threats to external validity followed the procedures identified by Lindner, Murphy, and Briers (2001). They recommended that if late respondents did not differ from early respondents, then the results could be extrapolated to the population. After the final email request's two week deadline a separate group of 18 participants that were identified as late responders. The 18 late responders were compared by analysis of variance to the 366 early responders in the independent variables, years of experience, NAAE region, number of teachers in program, size of school, number of students, number of FFA members, use

of record-books and economic impact. Based on the p value of .11 no significant statistical differences were found and the results were extrapolated to represent the total population of 5970 agriculture teachers (Hanagriff, Murphy, Roberts, Briers, & Lindner, 2010).

Descriptive Statistics

Both categorical and continuously measured variables were included in this study. The two categorical variables in this study included: the number of teachers in the program Q5, NAAE region Q6, and size of school Q7. The five continuously measured variables included: the number of teachers in the program Q5, teacher years of experience Q3, number of students Q8, number of FFA members, and number of students using record books Q10. For the categorical variables, frequencies and percentages are presented for analysis. Means (μ), standard deviations (σ) and ranges will be examined as well as normality.

Dummy coding was used for the size of school and region variables, which were categorically listed on the survey. This type of research is best suited to controlling the effects of a variable, such as prior knowledge, to assess the effects of a grouping variable. New variables were created equal to the number of groups minus one (a-1). The new variables express the individual score as a function of the difference in the means for the groups with the score of interest, coded 1, and the last group, which is coded 0 for both new variables, indicating that this group is the comparison group. The remaining group is also coded 0 for each new variable. When dummy coding, the mean for the last group (coded 0 for the new variables) becomes the constant in the linear expression and is compared with the mean for the group with the individual score of the interest, coded 1.

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Table 9

Descriptive Statistics for 2013-2014 School Year Survey of SAE Investment Costs (valid n =374).

SAE Name / Unit	Number of Programs with SAE	Number of SAEs	2013-2014 Average Investment Per Unit (M)	Std. Deviation
Show Heifer / head	107	827	$2,707.06	2,143.91
Show Steer / head	123	1001	$3,171.22	2,965.30
Breeding Beef Cattle / head	70	1465	$2,030.21	2,568.38
Dairy Production / head	32	2275	$1,790.63	1,622.40
Breeding Poultry / pen	41	393	$319.05	337.20
Show Broilers / pen	38	345	$330.82	325.72
Turkeys / pen	18	181	$655.28	694.79
Market Swine / head	159	4347	$635.37	502.03
Breeding Swine / head	52	682	$861.44	885.13
Market Lamb / head	111	1695	$666.08	709.54
Breeding Sheep / head	54	1298	$527.74	650.32
Aquaculture / tanks	26	168	$ 6.46	10.80
Floriculture / each	32	1012	$27.35	71.67

Horticulture / each	87	125624	$1,365.48	5,166.06
Market Goat / head	87	1513	$745.37	71.67
Equine / head	86	1116	$1,867.50	1,164.99
Crop/Forage Production /acres	43	356	$2,481.09	3,523.48
Agriculture Mechanics / each	101	1415	$657.62	913.05
	101	625.00	$1.68	32.36

Table 9 displays the quantitative data used for computing the Economic Impact factor

needed for the regression. For each type of SAE project, the projected values per unit and

number of units per responding agriculture program were multiplied to find the overall per

agriculture program value of each type of project. The resulting statistical data was analyzed for

the mean (μ) and standard deviation (σ) and n-value for SAE projects per agriculture program

and is displayed in Table 9.

Table 10

Total Projected Value and Economic Impact for SAEs (n=373).

Projected Values	Responses	Mean	Standard Deviation	Sum
Total	373	$1,162,226.88	$16,696,458.22	$433,510,625.00
Economic Impact	373	$310,884,113.55	$3,661,718,291.99	$78,031,912,500.00

Note: Utilizes IMPLAN multiplier for projected value

Using SSPS to analyze the SAE data collected by the survey generated a program mean value of 1162226.88 based on (N = 373). The SAE data is multiplied by the IMPLAN factor for agriculture of 1.80 (Hanagriff, Murphy, Roberts, Briers, & Lindner, 2010). The corresponding mean (μ) of 310884113.55 for economic impact will serve as the basis of our study.

Table 11

Frequency and Percentage of Categorical Variables

Categorical Variables	Categories	Frequency	Percent
Size of School	Very Small <300 Students	97	26.0
	Small 300-599 Students	80	21.4
	Medium 600-899 Students	68	18.2
	Large 900-1999 Students	92	24.7
	Very Large >2000	29	7.8
	Total	366	100
NAAE Region	Region I	57	15.2
	Region II	66	17.6
	Region III	84	22.3
	Region IV	52	13.8
	Region V	57	15.2
	Region VI	38	10.1
	Total	354	100

Table 12

Means, Standard Deviations and Range for Continuous Independent Variables.

Continuous Variable	Valid N value	Range	Mean	Standard Deviation
Teacher Experience	358	41	14.50	10.77
Number of Teachers in Program	365	5	1.60	.974
Number of Agriculture Students	361	2493	157.28	169.69
Number of FFA Members	363	604	98.36	82.04
Number of Students Completing Record Books	355	1000	74.11	113.93

Regression analysis is a statistical process for estimating the relationships among variables. It includes many techniques for modeling and analyzing several variables, when the focus is on the relationship between a dependent variable (DV) and one or more independent variables (IV). More specifically, regression analysis helps one understand how the typical value of the dependent variable (DV) changes when any one of the independent variables (IV) is varied, while the other independent variables are held fixed. Regression analysis estimates the average value of the dependent variable when the independent variable is fixed (Freedman,

2005). The regression analysis for this study explored the relationship of a dependent variables (DV) economic impact and seven independent variables (IV) school size, geographic region, teacher years of experience, number of teachers in program, number of agriculture students, number of FFA members, and number of students completing a record book. The model that included all of the IVs was not statistically significant.

Table 13
Variables in the Regression.

Variables	Mean	Std. Deviation	Standardized Beta Weights	P Value	N
(Dependent Variable)					
Economic Impact	303116531.25	3732022394.79			240
(Independent Variables)					
School Size	2.66	1.32	.106	.052	366
NAAE Region	3.28	1.59	.029	.283	354
Number of teachers in the program (Q5)	1.68	1.03	.182	.065	240
Number of Agriculture students /program (Q8)	165.35	187.87	.026	.814	240
Number of FFA members/program (Q9)	108.15	90.00	- .171	.072	240
Number of students utilizing record-books (Q10)	77.69	116.08	- .047	.66	240

Number of years of experience (Q3)	14.50	10.77	.023	240

Q represents corresponding survey questions.

Table 14

Anova

Model		Sum of Squares	df	Mean Square	P value.
1	Regression	283369297589114500000.000	14	20240664113508180000.000	.114
	Residual	3045420588507598400000.000	225	13535202615589327000.000	
	Total	3328789886096713000000.000	239		

ANOVAs are useful in comparing (testing) three or more means (groups or variables) for statistical significance (Ross & Shannon, 2011).The model with all IVs was not statistically significant due p-value exceeds 0.05 (Table 12).

Table 15

Means and Standard Deviations for Variables in Regression

Variables	Mean	Standard Deviation	N
Economic Impact	303116531.2500	3732022394.79031	240
Years of experience for the teacher	14.50	10.777	240
Teachers are in program	1.68	1.031	240
Number of Agriculture students in program	166.55	187.867	240
Number of FFA members in your program	108.15	90.000	240
Students that completed an annual record book	77.69	116.082	240

The R^2 value indicates that approximately 9% of the variance in Economic Impact that can be accounted for by its linear relationship with the IVs, years of experience, number of teachers in the program, number of agriculture students, number of FFA members, and number of students in the program that completed a record book.

Table 16

Model Summary

Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
1	.292	.085	.028	36579021964.54

Table 17 offers a comparison of Standardized Beta's and p values. Very large schools were statistically significantly different than very small, small, and medium schools.

Table 17
Variable Coefficients

Constant	Unstandardized Coefficients		Standardized Coefficients	p	t
	B	Std. Error	Beta		
Teachers in Program	1770994272.25	1145628778.23	.182	.065	1.546
Number of Agriculture Students	659991678.36	355568277.24	.026	.814	1.856
Number of FFA Members	-7107058.796	3926190.226	-.171	.072	-1.810
Number of Students with Record Books	-1503991.865	3412007.774	-.047	.66	-.441
NAAE Regions Q6					
Region I	162467027.88	878472408.05	.015	.85	.185
Region II	-90615804.89	896235387.77	-.008	.92	-.101
Region III	474070906.134	838682200.742	.048	.57	.565
Region IV	409433151.410	884401587.772	.037	.64	.463
Region V	1614326037.86	819628767.21	.162	.05	1.97
Region VI	125186936.94	987225660.31	-.009	.89	-.127

Size of School Q7					
Very Small	-2423761529.522	1013265021.193	-.28	.899	-2.39
Small	-2270062017.94	978739374.12	-.26	.018	-2.40
Medium	-2498183506.91	993962078.20	-.25	.021	-2.51
Large	-2477480359.67	908709977.51	-.30	.013	-2.73
Very Large	-2516682989.21	894237643.98380	-.30	.007	-2.65

Standardized coefficients or beta coefficients are the estimates resulting from an analysis carried out on independent variables that have been standardized so that their variances are 1. Therefore, standardized coefficients refer to how many standard deviations a dependent variable will change, per standard deviation increase in the predictor variable. Standardization of the coefficient is used to answer the question of which of the independent variables have a greater effect on the dependent variable in a multiple regression analysis, when the variables are measured in different units of measurement (Ross & Shannon, 2011). The beta weight tells you the relative importance of a predictor in predicting the criterion. The larger the absolute value of the beta weight, the more influence this factor has on predicting the criterion. Direct comparison of the absolute values of the respective beta weights of different predictors in a regression equation identifies the predictors that are relatively more important and which are less important in predicting the criterion variable (Freedman, 2005).

Table 18

Follow-up to school size using LSD

Approximate Size		Mean Difference (I-J)	Std. Error	Sig.
Very Small: under 300 students	Small: 300-599 students	-158664873.3103	668251181.19402	.813
	Medium: 600-899 students	-112494726.8571	730109784.93094	.878
	Large: 900-1999 students	-46081247.2836	645025950.41285	.943
	Very Large: 2000 or more students	-2516682989.2174[*]	889995593.49487	.005
Small: 300-599 students	Very Small: under 300 students	158664873.3103	668251181.19402	.813
	Medium: 600-899 students	46170146.4532	735274850.33102	.950
	Large: 900-1999 students	112583626.0268	650866564.03860	.863

		Mean Difference	Std. Error	Sig.
	Very Large: 2000 or more students	-2358018115.9070*	894237643.98380	.009
Medium: 600-899 students	Very Small: under 300 students	112494726.8571	730109784.93094	.878
	Small: 300-599 students	-46170146.4532	735274850.33102	.950
	Large: 900-1999 students	66413479.5736	714232413.90188	.926
	Very Large: 2000 or more students	-2404188262.3602*	941361578.14221	.011
Large: 900-1999 students	Very Small: under 300 students	46081247.2836	645025950.41285	.943
	Small: 300-599 students	-112583626.0268	650866564.03860	.863
	Medium: 600-899 students	-66413479.5736	714232413.90188	.926

	Very Large: 2000 or more students	-2470601741.9338*	877017559.37752	.005
Very Large: 2000 or more students	Very Small: under 300 students	2516682989.2174*	889995593.49487	.005
	Small: 300-599 students	2358018115.9070*	894237643.98380	.009
	Medium: 600-899 students	2404188262.3602*	941361578.14221	.011
	Large: 900-1999 students	2470601741.9338*	877017559.37752	.005

Follow-ups were completed on size and region given their statistical significance. Regional differences were not statistically significant when not controlling or removing the effects of the other IVs. The follow-up pairwise analyses did indicate that schools were statistically, significantly different based on size.

Table 19

Follow up using LSD for region

(I) In which NAAE/FFA Area is your program located?	(J) In which NAAE/FFA Area is your program located?	Mean Difference (I-J)	Std. Error	Sig.
I	II	48635913.7895	967687666.00551	.960
	III	60021075.7895	887077829.01998	.946
	IV	-63600314.2105	958925958.02860	.947
	V	-1542584469.9248	887077829.01998	.084
	VI	46556707.6077	1061464957.97666	.965
II	I	-48635913.7895	967687666.00551	.960
	III	11385162.0000	947139939.60884	.990
	IV	-112236228.0000	1014744294.61047	.912
	V	-1591220383.7143	947139939.60884	.094
	VI	-2079206.1818	1112148752.40492	.999
III	I	-60021075.7895	887077829.01998	.946
	II	-11385162.0000	947139939.60884	.990

	IV	-123621390.0000	938186356.35152	.895
	V	-1602605545.7143	864616516.72974	.065
	VI	-13464368.1818	1042766754.01331	.990
IV	I	63600314.2105	958925958.02860	.947
	II	112236228.0000	1014744294.61047	.912
	III	123621390.0000	938186356.35152	.895
	V	-1478984155.7143	938186356.35152	.116
	VI	110157021.8182	1104533576.45556	.921
V	I	1542584469.9248	887077829.01998	.084
	II	1591220383.7143	947139939.60884	.094
	III	1602605545.7143	864616516.72974	.065
	IV	1478984155.7143	938186356.35152	.116
	VI	1589141177.5325	1042766754.01331	.129
VI	I	-46556707.6077	1061464957.97666	.965
	II	2079206.1818	1112148752.40492	.999
	III	13464368.1818	1042766754.01331	.990
	IV	-110157021.8182	1104533576.45556	.921
	V	-1589141177.5325	1042766754.01331	.129

Research Question One:

Question one seeks to identify types of SAE projects that produce the most economic impact. Based on the mean values (μ) for the 20 types of SAE project identified in Chart 9, the following projects are ranked by economic impact per program; ranked first was show steers with a mean of $3172, ranked second was show heifers with a mean of $2707, ranked third was crops and forages with a mean of $2481, ranked fourth was breeding beef cattle with a mean of $2030, and ranking fifth was equine based on a mean of $1867.

Research Question Two:

What is the per-program estimated economic impact for students that are enrolled in Agriculture Education?

The economic impact that each agriculture education program realizes from the SAE projects is calculated based on correlation coefficients between the individual SAE project's, value projection and number of projects. Mean (μ) values (Table 9) for the twenty categories of SAE projects were correlated by program to generate the total per program mean (μ) of impact of 1162226.8767 (Table 10). Based on the results of the survey the economic impact and subsequent correlations the economic impact of each agriculture program would be $116226.88.

Research Question Three

What is the estimated economic impact, for SAE projects nationally?

Based on the results of the findings in this study, we could suggest that with an economic impact of 116226.88, for each program and total economic

impact of 310884113.55, for the sample population $(N = 373)$ might be applied

to the total population of agriculture programs of 5970. This would suggest a

national economic impact based on total number of programs (5970) X program

economic impact mean (116226.88) = the national SAE economic impact of

$693874473.

Research Question Four

How will the economic impact of SAE's compare on a regional basis (NAAE geographic regions

I - VI)?

To compare economic impact of SAEs regionally the total active agriculture educators

per region are multiplied by the per program economic impact to proximate a per region value.

Region 1 with $(N = 710)$ would have an economic impact of $8,135,881.60

Region 2 with $(N = 1141)$ would have an economic impact of $1,326,148.70

Region 3 with $(N = 912)$ would have an economic impact of $1,059,989.10

Region 4 with $(N = 1249)$ would have an economic impact of $1,451,673.70

Region 5 with $(N = 1376)$ would have an economic impact of $1,599,281.80

Region 6 with $(N = 582)$ would have an economic impact of $6,764,400.40

The results of this analysis based on the projected mean values per region indicate that economic

impact per region in order of total value from greatest to least; are Region 5, Region 4, Region

2, Region 3, Region 1, and Region 6.

Research Question Five

Could a predictive model to determine Economic Impact be developed?

Regression analysis was utilized for estimating the relationships among the variables since this model allows analyzing several variables. The relationship between the dependent variables (DV) and one or more independent variables (IV) in the regression analysis estimates the average value of the dependent variable (DV) changes when any one of the independent variables (IV) is varied, while the other independent variables are held fixed.

The regression analysis for this study explored the relationship of a dependent variables (DV); economic impact, with seven independent variables (IV): school size, geographic region, teacher years of experience, number of teachers in program, number of agriculture students, number of FFA members, and number of students completing a record book. The model that included all of the IVs was not statistically significant. An analysis of standardized beta weights indicated statistical significance for region, and size of school.

Follow-ups were completed on size and region given their statistical significance. Regional differences were not statistically significant when not controlling or removing the effects of the other IVs. The follow-up pairwise analyses did indicate that schools were statistically, significantly different based on size. Therefore a predictive model for statistical significance of economic impact could be developed.

Null Hypotheses

There is statistically significant difference in the predictors. The predictor variable, school size will account for a statistically significant portion of the variance in Economic Impact of SAEs therefore the null hypothesis was rejected.

Chapter 5

Summary, Conclusions, Recommendations, Implications, and Discussion

Summary

"The SAE concept is one of the unique characteristics that separates Agricultural

Education from other subject areas" (Bryant, 2003, p. 5). The educational value and purpose of

the Supervised Agricultural Experience (SAE) component of Agriculture Education and how it

relates to student achievement and knowledge is well defined by previous research (Cheek,

Arrington, Carter, & Randall 1994; Croom, 2008; Phipps, Osborne, Dyer & Ball, 2008). The

SAE challenges students to gain new skills and experiences (Bryant, 2003). The SAE also

requires financial investment in capital purchases, supplies, and travel expenses for the various

types of project; Entrepreneurship, Placement, Exploratory and Research/Experimentation

(National FFA Organization, 2011.n.p.). Previous studies have examined the economic impact of

SAEs on individual states but there is little research to project this information to a nation-wide

basis.

Purpose

The purpose of this study was to address the recommendation of Hanagriff, Murphy,

Roberts, Briers and Lindner (2010) to track Supervised Agricultural Experience investments

expenditures and receipts on a national and a regional basis. The structure and format of the study was replicated from the Hanagriff (2010) study, completed in Texas in 2007-2008. This research would be an attempt to produce a quantitative estimate of the value of SAE's to the students' local economies on a nationwide basis and make a comparison of said value between the various geographic regions (NAAE regions I - VI) of the nation. **.**

The calculation of economic benefits utilized IMPLAN, a computer software package that consists of procedures for estimating local input-output models and associated databases. The acronym IMPLAN is for Impact Analyses and Planning. IMPLAN was originally developed by the U.S. Forest Service in cooperation with the Federal Emergency Management Agency and the U.S. Department of the Interior's Bureau of Land Management to assist in land and resource management planning (Mulkey & Hodges, 2008). This model is utilized in business, education and tourism by identifying economic benefits from spending money in a certain sector. IMPLAN economic benefits have several levels of multipliers, but the most comprehensive and conservative is the Type II multiplier value (Hanagriff , 2010). As a replicated study the IMPLAN values utilized by Hanagriff (2010), were calculated at $1.80 for agriculture expenditures and $2.09 for travel cost. This would indicate that an additional spending of $1.00 in the agriculture industry or travel industry would result in a total change in local output of $1.80 for agriculture and $2.09 for travel related values.

This quantitative data supports the economic benefits for agriculture programs and overall accountability to the various stakeholders involved in supporting the program (Cole and Connell, 1993). With the state of the economy, in terms of educational funding, this could serve a valuable function for justifying long range value of agriculture programs to the local

communities. Economic values of Agricultural Education need to be communicated to school administration, state leaders, and potential funding sources that support Agricultural Education (Hanagriff, 2010).

Assumptions

This study replicates an SAE economic impact survey conducted in Texas in 2007-2008 by Hanagriff, Murphy, Roberts, Briers and Lindner (2010). Due to the high cost for IMPLAN software per student, the Texas IMPLAN factor for agriculture ($1.80) and transportation ($2.09) was used to determine the economic input into the national economy. This assumes that Texas's economy for these industries, are representative of the nation.

Research Questions

The following research questions were used to guide this study:

1. Which types of SAE projects produce the most economic impact?

2. What is the estimated economic impact, on a per-school basis, for students that are enrolled in Agriculture Education?

3. What is the estimated economic impact, for SAE projects nationally?

4. How will the economic impact of SAE's compare on a regional basis (NAAE geographic regions I - VI)?

5. Can a predictive model to determine Economic Impact be developed?

Null Hypotheses

There is no statistically significant difference in predictors. No predictor variable or combination of variables will account for a statistically significant portion of the variance in economic impact of SAEs.

Population

The population for this study consists of a sample of agriculture education teachers from across the nation and the data for the study will be based on their perceptions. All 5,970 members of the National Association of Agriculture Educators (NAAE) will be asked to participate in the study. The NAAE is a federation of 50 state agricultural educators associations. The National Association of Agricultural Educators (NAAE) in cooperation with Purdue University has developed an electronic mail list-serve for use by agricultural education teachers, state staff, teacher educators, and others interested in agricultural education (National Association of Agricultural Educators, 2013). The list-serve allows someone to send one message to the list-serve and have that message forwarded on to all subscribers to the list. It has capabilities to send text messages and attached files allowing interaction with the various members. Through the utilization of the list-serve a wide range of participants may be readily reached.

Participants consisted of 366 active agriculture teachers that are members of NAAE and represent all six regions of the nation (illustration 1). The regional distribution of the 366 participants consisted of 49 from region I, 46 from region II, 70 from region III, 43 from Region IV, 56 from Region V, and 33 from region VI.

Table 20

Demographics of Participants

Variable	Total Responses	Mean	Range	Std. Deviation
Teacher years of experience	366	14.50	41	10.777
Teachers in local program	365	1.60	5	0.97
NAAE Region	311	3.56	3.27	1.81
Size of School	366	2.66	1.74	1.32
Number of Ag Students	361	157.28	2495	169.69
Number of FFA Members	363	98.36	604	82.04
Number using Record books	355	74.11	1000	113.92

Research Design

The structure and format of the study is replicated from the Hanagriff (2010) study, conducted in Texas in 2007-2008. As a replicated study the IMPLAN values utilized by Hanagriff (2010), were calculated at $1.80 for agriculture expenditures and $2.09 for travel cost. This would indicate that an additional spending of $1.00 in the agriculture industry or travel industry would result in a total change in local output of $1.80 for agriculture and $2.09 for travel related values.

An economic impact dependent variable (DV) was derived by calculating a mean value per project which was multiplied by the number of project units which represented the economic value of the SAE project per program. The economic values per program were multiplied by the IMPLAN factor ($1.80 for agriculture) to reach the economic impact factor (116222.8768) per agriculture program. The mean value (μ) of the program economic impact factors (310884113.548) identifies the total economic impact for the study. Based on the results from this study multiplication of the program economic impact factor by number of agriculture programs in a region or in the nation could provide valuable implications.

A standard multiple regression was completed to address the research question asking could a predictive model to determine economic impact be developed. The standard multiple regression, through the standardized beta weights, addressed the research question to which of the seven predictors; years of experience, region of the nation, number of teachers in program, size of the school, number of students, number of FFA members, and use of record books, carries more weight in the prediction of the total economic impact of SAEs

Variables

The constant or dependent variable in this study is the economic impact of the SAEs. The economic impact factor is a measure of the effects to the local economy based on expenditures and investment costs. For this study, economic impact is calculated by multiplying the estimated investment costs by total number of projects to get a per program value. By multiplying these results by the $1.80 IMPLAN factor for agriculture a per program economic impact factor is created. The independent variables utilized in the study included; teacher years of experience,

Region of the nation, number of teachers in the program, size of the school, total number of students, number of FFA members, and number of students using record books.

Instrumentation

For this study we utilized a combination of close-ended (Likert-type) questions and a group of partial close-ended questions. The survey instrument included demographic information, a list of placement and entrepreneurship projects. Respondents begin the survey by replying to questions regarding demographics, years of teaching experience, school size classification, agriculture education program student enrollment numbers and FFA membership. Following the demographic questions, respondents were asked to estimate their annual travel miles in program vehicles and their annual hotel room usage. The remainder of the survey asked respondents to describe their SAE programs within their programs.

Salant and Dillman (1994) noted that response options should be limited to less than five choices and a series of questions should be used to address complex and abstract issues. Closed-ended questions may also be categorized as: (a) questions that describe and evaluate people, places, and events; (b) questions that measure responses to ideas, analyses, and proposals; and (c) questions that measure knowledge. Close-ended questions should be limited to less than five choices. The choices form a continuum of responses, such as those provided by the Likert scales and numerical ranges. The survey will utilize the Likert scale type questions for the quantitative data needed. These types of questions are easiest for respondents to answer and to researchers to analyze the data. Multiple choice questions are an example of this type. The researcher must ensure that the respondent is given a comprehensive selection of responses. Closed-ended questions with unordered choices are useful for ranking items in order of preference. The closed-

ended questions which the respondent is asked to compare possible responses and select one, or write in other seem to work best. Salant and Dillman (1994) observed that most respondents choose one of the given responses when this type of question is presented. Beliefs, attitudes, and behaviors are also often inadequately contemplated. Salant and Dillman (1994) suggested that researchers use a series of related questions to gauge beliefs, attitudes, and behaviors, and then examine the responses to identify patterns and consistencies in the answers. The survey should ask for specific recommendations to be accepted or rejected, or to rank the relative importance of competing interests.

Data Collection

The National Association of Agricultural Educators (NAAE) in cooperation with Purdue University has developed an electronic mail list-serve for use by agricultural education teachers, state staff, teacher educators, and others interested in agricultural education (National Association of Agricultural Educators, 2013). The list-serve allows someone to send one message to the list-serve and have that message forwarded on to all subscribers to the list. It has capabilities to send text messages and attached files allowing interaction with the various members. Through the utilization of the list-serve a wide range of participants may be readily reached.

Initially an introductory email was sent, explaining the nature and significance of the study. The initial e-mail will be sent to all NAAE member educators, following, Dillman (2000), recommendations, and will include a link to the survey which is available on Qualtrics. Qualtrics is an on-line survey instrument designed to collect and analyze data. Respondents will be asked

to return one survey per chapter and the chapter FFA number will be used as a control value. Responses will be grouped by state and region for data analysis. Teachers will be asked to respond within a two week time period. Additionally survey requests will be emailed utilizing NAAE directories with every fourth member receiving a survey request. Following the initial request two reminder emails will be sent on a two week interval.

Data collection through the survey method seemed to be the best means of reaching out to membership of a national organization such as the NAAE. Isaac & Michael (1997), stated that survey research is used: "to answer questions that have been raised, to solve problems that have been posed or observed, to assess needs and set goals, to determine whether or not specific objectives have been met, to establish baselines against which future comparisons can be made, to analyze trends across time, and generally, to describe what exists, in what amount, and in what context" (p. 52). According to Salant and Dillman (1994) the choice of survey medium is determined by the resources that are available. Written surveys require minimum resources (staff, time, and cost) and are best suited to eliciting confidential information. Minimal sampling error occurs due to the relatively low cost per survey. There are also minimal interviewer and respondent measurement errors due to the absence of direct contact (Salant & Dillman, 1994). Written surveys allow the respondent the greatest latitude in pace and sequence of response. Convenience for both the participants and the researcher is also a factor to consider when attempting reaching large broad-based groups and was a major factor considered in this study. Written surveys may be distributed using either postal or electronic mail. A survey is simply a data collection tool for carrying out survey research. Pinsonneault and Kraemer (1993) defined a survey as a means for gathering information about the characteristics, actions, or opinions of a

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large group of people. Surveys can also be used to assess needs, evaluate demand, and examine

impact (Salant & Dillman, 1994). Based on this reasoning the survey method of data collection

provided the only viable source of data. The expansive and diverse nature of the population

made survey collection an obvious choice.

On November 11, 2013 the initial email requesting participation was posted on the list-

serve. After two weeks there were 137 responses recorded. In an effort to increase participation

every fourth person on the email listings received the request in order to stimulate additional

response. The result was 195 individual requests followed by the second posting on the list-serve

which yielded an additional 161 responses. Since the participants were active teachers and the

list-serve was primarily through school addresses the two week holiday period was excluded so

the final request was sent on January 6, 2014. Soon after this period began many prospective

participants noticed software conflicts with the Qualtrics survey link. Re-sending the

introductory letter corrected some, providing a total of 362 completed documents. The remaining

12 were downloaded and handwritten at the request of participants and manually entered. The

374 total usable surveys included in the study represented 6% of the population.

Data Analysis

A standard multiple regression was completed to address the research question asking

could a predictive model to determine economic impact be developed? The standard multiple

 regression through the standardized beta weights, addressed the research question to which of

the seven predictors; years of experience, region of the nation, number of teachers in program, size of the school, number of students, number of FFA members, and use of record books, carries more weight in the prediction of the total economic impact of SAEs.

The results indicated that, only school size carried more weight in the prediction of overall economic impact. A comparison of the standardized beta weights indicates that size of school is the only statistically significantly predictor of the total economic impact of the SAEs. Q7 Size 4, which depicts the large schools ($\beta = -2.96$, $\rho = -2.726$)is the only variable with statistical significance based on the current study (Table 16). The follow-up pairwise analyses did indicate that schools were statistically, significantly different based on size (tables 17 and 18).

Handling non-responses and threats to external validity followed the procedures identified by Lindner, Murphy, and Briers (2001). They recommended that if late respondents did not differ from early respondents, then the results could be extrapolated to the population. After the final email request's two week deadline a separate group of 18 participants that were identified as late responders. The 18 late responders were compared to the 366 early responders in the independent variables, years of experience, NAAE region, number of teachers in program, size of school, number of students, number of FFA members, use of record-books and economic impact. Because no significant differences were found, the results were extrapolated to represent the total population of 5,970 (Hanagriff, Murphy, Roberts, Briers, & Lindner, 2008).

Conclusions

The purpose of this study was to address the recommendation of Hanagriff, Murphy, Roberts, Briers & Lindner (2010) to track Supervised Agricultural Experience investments, expenditures and receipts on a national and a regional basis. The structure and format of the study is replicated from the Hanagriff (2010) study, completed in Texas in 2007-2008. This research attempted to produce a quantitative estimate of the value of SAE's to the students' local communities and on a nationwide basis while making comparisons of said value between the various geographic regions (NAAE regions I - VI) of the nation.

The first objective of this study was to determine which types of SAE projects produce the most economic impact. Based on the mean values (μ) for the 20 types of SAE project identified in Chart 9, the following projects are ranked by economic impact per program; first was show steers with a mean of $3172, ranked second was show heifers with a mean of $2707, ranked third was crops and forages with a mean of $2481, ranked fourth was breeding beef cattle with a mean of $2030, and ranking fifth was equine based on a mean of $1867. The structure and format used to extrapolate values were parallel to studies conducted by Hanagriff, Murphy, Roberts, Briers, & Lindner, (2008), McHugh (2010), and Mulkey & Hodges(2000).

The second objective was to estimate the economic impact, on a per-school or program basis, for students that are enrolled in agriculture education. Based on the results of the survey, economic impact for each type of SAE and subsequent correlations too total economic impact, utilizing the IMPLAN factor, for each agriculture program would result in a mean value of $116226.88.

The third objective of this study was to estimate economic impact, for SAE projects nationally. Based on the results of the findings in this study, we could suggest that with an economic impact of $116226.88, for each program and total economic impact of $310884113.55, for the sample population (N = 373) might be applied to the total population of agriculture programs of 5970. This would suggest a national economic impact based on total number of programs (5970) X program economic impact mean ($116226.88) = the national SAE economic impact of $693874473.

The fourth objective of this study was to compare economic impact of SAE's on a regional basis (NAAE geographic regions I - VI). To compare economic impact of SAEs regionally, the total active agriculture educators per region are multiplied by the per program economic impact to proximate a per region value. The results of this analysis based on the projected mean values per region, indicate that economic impact per region in order of total value from greatest to least; are Region 5, Region 4, Region 2, Region 3, Region 1, and Region 6

The fifth objective sought to develop a predictive model to determine Economic Impact. The regression analysis for this study explored the relationship of seven independent variables including two categorical; school size and geographic region, and five continuous; teacher years of experience, number of teachers in program, number of agriculture students, number of FFA members, and number of students completing a record book with a dependent variable, economic impact. The model that included all of the IVs was not statistically significant. An analysis of standardized beta weights indicated statistical significance for region, and size of school.

Follow-ups were completed on size and region given their statistical significance. Regional differences were not statistically significant when not controlling or removing the

effects of the other IVs. The follow-up pairwise analyses did indicate that large schools were statistically, significantly different based on size. The large size school translating to greater economic impact would appear a foregone conclusion and the analyses indicated that this was true. Therefore a predictive model for statistical significance of economic impact could be developed based on the size of the school.

Recommendations

The methodology for providing accurate projections of total economic costs is somewhat unknown. The key to more accurate, well-defined data is definitely correlated to a more uniform and accessible student record keeping system. This study replicates the work of Hanagriff, Murphy, Roberts, Briers and Lindner (2010) in which Hanagriff commented "the actual cost of SAE programs remains difficult to estimate" (p.78). The survey asked teachers to estimate the values collected and are subject to the possibility of human error.

Hanagriff (2010) suggested that a statewide or even nationwide student recordkeeping system to assist the students themselves in keeping more accurate records of SAE investment, expenditures and receipts (p.78). Based on the responses from this study, only 47.11 percent of agriculture students kept any form of annual record book. The availability of a uniform record book that is student generated could resolve many of the ambiguity issues in obtaining accurate quantitative data.

A targeted result of this study was to examine the economic impact of the SAEs of agriculture students. The economic values derived from this study can serve to promote the positive economic contributions of and fiscal accountability of SAEs.

Limitations

This study was limited to the responses received from secondary Agriculture Education teachers from across the nation, through a census survey utilizing a professional list-serve. When compared with other survey instruments, web surveys produce lower response rates than computer-assisted telephone interview (CATI), interactive voice response (IVR), and mail surveys (Dillman, 1999). The response rate to individual requests was much greater, indicating that a higher response rate might be achieved through that method of soliciting data.

The length of the instrument (fifty-eight questions) and time required for completion (average of ten minutes) may have contributed to non-response and or partial responses. Since the survey is of actively teaching agriculture instructors, being able to commit the time to complete the documents may be a limitation. Reducing the survey length by consolidating some items to make it less time consuming could attract more respondents.

Survey questions and subsequent responses are subject to the teacher's perception and interpretation. Due to the vast differentiation within this topic, the question and subsequent answer options could lead to unclear data because certain answer options may be interpreted differently by respondents.

Survey answers were based on teacher estimates and not on written and documented data from individual students. Therefore, a further limitation of the study was teacher estimation of the values implemented by the survey from their knowledge of the student's projects.

Implications

   Adequate sample size is a problem when attempting to extract accurate quantitative data over such a large population of participants. Additional work to define a more effective methodology for collecting data is needed. A state or nationwide system of student recordkeeping that could be transposed to a wide variety of student clientele and has the technological applications to allow for the collection of accurate quantitative data directly from the student records. Not only would the accuracy and participation increase but the ability to aggregate student experiences across programs to produce local reports for school administrators and overall economic impact reports for interested stakeholders and legislative representatives.

Major Contributions of this Study

   This quantitative data can be used to support the economic benefits for agriculture programs and overall accountability to the various stakeholders involved in supporting the program (Cole and Connell, 1993). With the state of the economy, in terms of educational funding, this could serve a valuable function for justifying long range value of agriculture programs to the local communities. Economic values of Agricultural Education need to be communicated to school administration, state leaders, and potential funding sources that support Agricultural Education (Hanagriff, 2010).

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Appendix 1

NAAE REGIONS
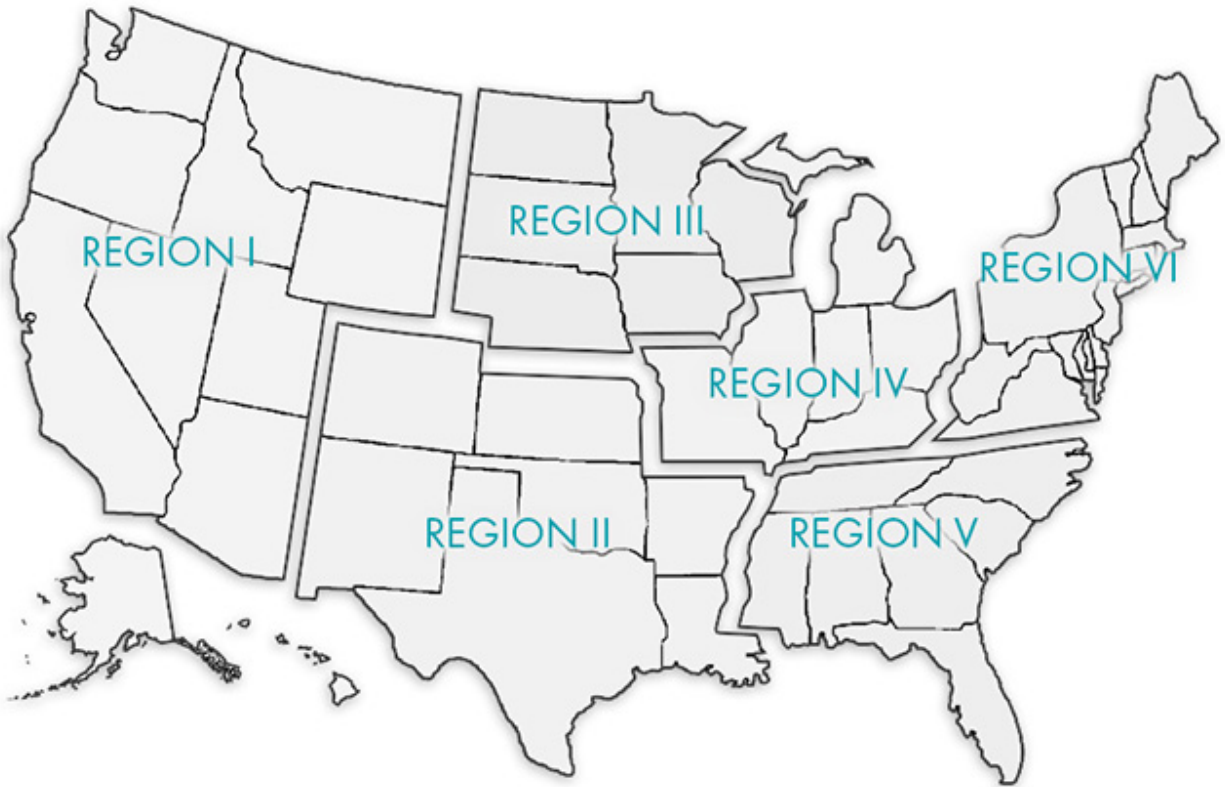
Appendix 2

AUBURN UNIVERSITY INSTITUTIONAL REVIEW BOARD for RESEARCH INVOLVING HUMAN SUBJECTS
R E S E A R C H   P R O T O C O L   R E V I E W   F O R M

For Information or help contact **THE OFFICE OF RESEARCH COMPLIANCE**, 115 Ramsay Hall, Auburn University
Phone: 334-844-5966   **e-mail:** hsubjec@auburn.edu   **Web Address:** http://www.auburn.edu/research/vpr/ohs/

Revised 03.26.11 – DO NOT STAPLE, CLIP TOGETHER ONLY. | Save a Copy |

1. PROPOSED START DATE of STUDY: Aug 1, 2013

PROPOSED REVIEW CATEGORY (Check one):   **FULL BOARD**   **EXPEDITED**   ✓ **EXEMPT**

2. PROJECT TITLE: THE ECONOMIC IMPACT OF THE SUPERVISED AGRICULTURAL EXPERIENCE IN AGRICULTURE EDUCATION FROM A NATIONAL PERSPECTIVE

3. Michael K. Riley   Student   C & T   706-977-3726   MKR0012@auburn.edu
PRINCIPAL INVESTIGATOR   **TITLE**   **DEPT**   **PHONE**   **AU E-MAIL**

102 Bridgewater Drive LaGrange, GA 30240   rileymk@hotmail.com
MAILING ADDRESS   **FAX**   **ALTERNATE E-MAIL**

4. SOURCE OF FUNDING SUPPORT: ✓ Not Applicable ⬜ Internal ⬜ External Agency:_____ ⬜ Pending ⬜ Received

5. LIST ANY CONTRACTORS, SUB-CONTRACTORS, OTHER ENTITIES OR IRBs ASSOCIATED WITH THIS PROJECT:
none

6. GENERAL RESEARCH PROJECT CHARACTERISTICS

6A. Mandatory CITI Training	6B. Research Methodology
Names of key personnel who have completed CITI: Michael K. Riley Dr. Brian Parr **CITI group completed for this study:** ✓ Social/Behavioral ⬜ Biomedical **PLEASE ATTACH TO HARD COPY _ALL_ CITI CERTIFICATES FOR _EACH_ KEY PERSONNEL**	Please check all descriptors that best apply to the research methodology. Data Source(s): ✓ New Data ⬜ Existing Data Will recorded data directly or indirectly identify participants? ⬜ Yes ✓ No Data collection will involve the use of: __ Educational Tests (cognitive diagnostic, aptitude, etc.) ⬜ Interview / Observation ⬜ Physical / Physiological Measures or Specimens (see Section) ✓ Surveys / Questionnaires ✓ Internet / Electronic ⬜ Audio / Video / Photos ⬜ Private records or files

6C. Participant Information	6D. Risks to Participants
Please check all descriptors that apply to the participant population. ✓ Males ✓ Females ⬜ AU students **Vulnerable Populations** ⬜ Pregnant Women/Fetuses __ Prisoners ⬜ Children and/or Adolescents (under age 19 in AL) **Persons with:** ⬜ Economic Disadvantages ⬜ Physical Disabilities ⬜ Educational Disadvantages ⬜ Intellectual Disabilities Do you plan to compensate your participants? __ Yes ✓ No	Please identify all risks that participants might encounter in this research. ✓ Breach of Confidentiality* ✓ Coercion ⬜ Deception ⬜ Physical ⬜ Psychological ⬜ Social ⬜ None ⬜ Other: *Note that if the investigator is using or accessing confidential or identifiable data, breach of confidentiality is always a risk.

Do you need IBC Approval for this study? ✓ No ⬜ Yes - BUA #_____   **Expiration date** _____

FOR OHSR OFFICE USE ONLY	
DATE RECEIVED IN OHSR: 9/6/13 by BK	**PROTOCOL #** 13-275 EX 1309
DATE OF IRB REVIEW: 9/8/13 by CC	**APPROVAL CATEGORY:** 45CFR 46.101(b)(2)
DATE OF IRB APPROVAL: _____ by _____	**INTERVAL FOR CONTINUING REVIEW:** 3years
COMMENTS:	

7. PROJECT ASSURANCES

PROJECT TITLE: THE ECONOMIC IMPACT OF THE SUPERVISED AGRICULTURAL EXPERIENCE IN AGRICULTURE EDUCATION FROM A NATIONAL PERSPECTIVE

A. PRINCIPAL INVESTIGATOR'S ASSSURANCES

1. I certify that all information provided in this application is complete and correct.
2. I understand that, as Principal Investigator, I have ultimate responsibility for the conduct of this study, the ethical performance this project, the protection of the rights and welfare of human subjects, and strict adherence to any stipulations imposed by the Auburn University IRB.
3. I certify that all individuals involved with the conduct of this project are qualified to carry out their specified roles and responsibilities and are in compliance with Auburn University policies regarding the collection and analysis of the research data.
4. I agree to comply with all Auburn policies and procedures, as well as with all applicable federal, state, and local laws regarding the protection of human subjects, including, but not limited to the following:
   a. Conducting the project by qualified personnel according to the approved protocol
   b. Implementing no changes in the approved protocol or consent form without prior approval from the Office of Human Subjects Research
   c. Obtaining the legally effective informed consent from each participant or their legally responsible representative prior to their participation in this project using only the currently approved, stamped consent form
   d. Promptly reporting significant adverse events and/or effects to the Office of Human Subjects Research in writing within 5 working days of the occurrence.
5. If I will be unavailable to direct this research personally, I will arrange for a co-investigator to assume direct responsibility in my absence. This person has been named as co-investigator in this application, or I will advise OHSR, by letter, in advance of such arrangements.
6. I agree to conduct this study only during the period approved by the Auburn University IRB.
7. I will prepare and submit a renewal request and supply all supporting documents to the Office of Human Subjects Research before the approval period has expired if it is necessary to continue the research project beyond the time period approved by the Auburn University IRB.
8. I will prepare and submit a final report upon completion of this research project.

My signature indicates that I have read, understand and agree to conduct this research project in accordance with the assurances listed above.

Michael K. Riley	_(signature)_	Jul 24, 2013
Printed name of Principal Investigator	**Principal Investigator's Signature** (SIGN IN BLUE INK ONLY)	**Date**

B. FACULTY ADVISOR/SPONSOR'S ASSURANCES

1. By my signature as faculty advisor/sponsor on this research application, I certify that the student or guest investigator is knowledgeable about the regulations and policies governing research with human subjects and has sufficient training and experience to conduct this particular study in accord with the approved protocol.
2. I certify that the project will be performed by qualified personnel according to the approved protocol using conventional or experimental methodology.
3. I agree to meet with the investigator on a regular basis to monitor study progress.
4. Should problems arise during the course of the study, I agree to be available, personally, to supervise the investigator in solving them.
5. I assure that the investigator will promptly report significant adverse events and/or effects to the OHSR in writing within 5 working days of the occurrence.
6. If I will be unavailable, I will arrange for an alternate faculty sponsor to assume responsibility during my absence, and I will advise the OHSR by letter of such arrangements. If the investigator is unable to fulfill requirements for submission of renewals, modifications or the final report, I will assume that responsibility.
7. I have read the protocol submitted for this project for content, clarity, and methodology

Dr. Brian Parr	_(signature)_	7-25-13
Printed name of Faculty Advisor / Sponsor	**Signature (SIGN IN BLUE INK ONLY)**	**Date**

C. DEPARTMENT HEAD'S ASSSURANCE

By my signature as department head, I certify that I will cooperate with the administration in the application and enforcement of all Auburn University policies and procedures, as well as all applicable federal, state, and local laws regarding the protection and ethical treatment of human participants by researchers in my department.

Dr. Kim Walls	_(signature)_	7-25-13
Printed name of Department Head	**Signature (SIGN IN BLUE INK ONLY)**	**Date**

2

Appendix 3

COLLEGE OF EDUCATION

CURRICULUM AND TEACHING

[NOTE: DO NOT AGREE TO PARTICIPATE UNLESS IRB APPROVAL INFORMATION WITH CURRENT DATES HAS BEEN ADDED TO THIS DOCUMENT.]

INFORMATION LETTER

for a Research Study entitled

"THE ECONOMIC IMPACT OF THE SUPERVISED AGRICULTURAL EXPERIENCE IN AGRICULTURE EDUCATION FROM A NATIONAL PERSPECTIVE"

You are invited to participate in a research study to determine the national economic impact of agriculture education's, supervised agricultural experience programs. While research has been conducted on a state by state basis as to the economic impact of student SAEs, there has been little done to explore the national impact. This quantitative data will be used to prove the economic benefits of agriculture programs and overall accountability. In the midst of the current economic environments, this study will assist with validating educational funding. In addition this study should justify the long range value of agriculture programs to the local communities.

The study is being conducted by Michael Riley, graduate student at Auburn University and current high school agriculture teacher, under the direction of Dr. Parr, Associate Professor in the Auburn University Department of Curriculum and Teaching. You were selected as a possible participant because as a member of NAAE, a national organization of agriculture teachers, you can best represent all regions of the nation. As a participant you must be of the age of consent for your state of residence. Your participation is completely voluntary. If you decide to participate in this research study, you will be asked to complete an on-line survey by following the link below. Your total time commitment will be approximately 15 minutes. **To thank you for your time you will be offered an opportunity to be included in a drawing for two $100 Bass Pro Shops gift certificates upon completion of the survey with incentives awarded based on FFA national chapter number.**

The proposed research investigates normal educational practices. The data that will be recorded for research purposes has a basis in instruction. Minimal risk is foreseen. If you change your mind about participating, you can withdraw at any time by simply closing the browser window. If you choose to withdraw, your data can be withdrawn as long as it is identifiable. Once you've submitted this confidential data, it cannot be withdrawn since the data becomes relatively anonymous and significantly difficult to locate. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Auburn University

Any data obtained in connection with this study will remain confidential. Answers are confidential and only summary information will be reported. Participation is by choice. The information collected through your participation may be used to fulfill an educational requirement, published in a professional journal, and/or presented at a professional meeting, etc.

If you have questions about this study, please contact Michael Riley at mkr0012@auburn.edu or Dr. Parr at bap0007@auburn.edu. If you have questions about your rights as a research participant, you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334) 844-5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu. Having read the information above, you must decide if you want to participate in this research project. If you elect to participate, *PLEASE CLICK ON THE LINK BELOW.*

Michael Riley 9-25-13
Investigator   Date

Parr 9-25-13
Co-Investigator   Date

The Auburn University Institutional Review Board has approved this document for use from 9/8/13 *to* 9/17/16 *. Protocol #* 13-275 EX 1309

LINK TO SURVEY

https://auburn.qualtrics.com/SE/?SID=SV_eVgBL3iLozGNT2I
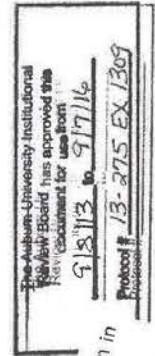
Appendix 4

Consider the Opportunity To Help Keep Ag. Education Strong & Win Bass Pro Gift Certificates

You are invited to participate in a research study to determine the national economic impact of agriculture education's, supervised agricultural experience programs. The study is being conducted by Michael Riley, graduate student at Auburn University and current high school agriculture teacher. This quantitative data will be used to prove the economic benefits of agriculture programs and overall accountability. In the midst of the current economic environments, this study will assist with validating educational funding. In addition, a goal of this research is justifying the long range value of agriculture programs to the local communities.

Deciding to participate in this research will include the completion of an on-line survey which is accessed by following the link below. Your total time commitment will be approximately 15 minutes. **To thank you for your time and dedication to complete the survey, you will be offered an opportunity to be included in a drawing for two $100 Bass Pro Shop gift certificates.**

Please contact Michael Riley at rileymk@troup.org for questions regarding the survey. Additional details regarding the risks involved are available at the second link below. All data obtained in connection with this study will remain confidential.

__LINK TO SURVEY__
https://auburn.qualtrics.com/SE/?SID=SV_0pUs32auTeRn6ip

Information Letter (1).pdf
605K View Download

Appendix 5

National Assessment of SAE Projects in Agriculture Education*

Q1 During the 2012-2013 school year, which of the following best describes your programs level of SAE involvement? (Not involved responses will skip the remainder of the survey).
○ My program was involved in various SAE's. (1)
○ My program was not involved in any SAE's because of lack of student interest. (2)
○ My program was not involved in any SAE's because of lack of school support (3)

Q2 During the 2012-2013 school year, did you teach agriculture education?
○ Yes (1)
○ No (2)

Q3 How many years of experience do you currently have? (whole numbers only)

Q4 Please identify your national chapter number used to check for   duplicate chapter entries, (EX. AL0330)

Q5 How many teachers are in your program?
○ one (1)
○ two (2)
○ three (3)
○ four (4)
○ five (5)
○ over five (6)

Q6 In which NAAE/FFA Area is your program located?
○ I (1)
○ II (2)
○ III (3)
○ IV (4)
○ V (5)
○ VI (6)
○ VII (7)
○ VIII (8)

Q7 What is the approximate size of your school?
○ Very Small: under 300 students (1)
○ Small: 300-599 students (2)
○ Medium: 600-899 students (3)
○ Large: 900-1999 students (4)
○ Very Large: 2000 or more students (5)

Q8 Please estimate the approximate number of AG STUDENTS in your program for the 2012-2013 school year.

Q9 Please estimate the approximate number of FFA MEMBERS in your program during the 2012-2013 school year

Q10 During the 2012-2013 school year, how many students in your program completed an annual record book?   (regardless of level in school)

Q11 The following questions relate to the amount of travel involved in education activities.   What are the total miles your program travels annually in order to attend agricultural education events? (whole numbers only. No comma or period, ex. 20000).   School Vehicle
    School Vehicle (1)
    Personal Vehicle (2)

Q12 Select the response that best fits each statement.

	Click to write Scale point 1 (1)	Click to write Scale point 2 (2)	Click to write Scale point 3 (3)	Click to write Scale point 4 (4)	Click to write Scale point 5 (5)
The value my school administration places in supporting my ag. ed. program is best described as (1)	O	O	O	O	O
The level of dollar funding for my program from my school is best described as... (2)	O	O	O	O	O
My community places this level of value on my agriculture education program (3)	O	O	O	O	O

Q13 Participants should indicate their perception of the development of life skills through SAE's.

	Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)
Cooperation (1)	O	O	O	O	O
Motivation (2)	O	O	O	O	O
Communication (3)	O	O	O	O	O
Responsibility (4)	O	O	O	O	O
Leadership (5)	O	O	O	O	O

Q14 How many total hotel rooms does your chapter use ANNUALLY for students, parents, and yourself while traveling to FFA and educational activities? (Only enter whole number amounts, example 50)

Q15 Please answer the following questions about your programs involvement in SAE's. These questions refer to your chapter for the 2012-2013 school year.   Which of the following statements best describes your chapter's use and involvement in recording SAE projects?
- O We do not use record books (1)
- O We use record books for the year a student is seeking an award (2)
- O We use record books annually for all active and involved students (3)
- O We use record books for all students, even students with only class journals and those without an SAE (4)

Q16 For each of the following SAE project categories, please provide a % that best describes your students   involvement in each SAE. (place a 0 in the box for none)
     % Entrepreneurship (projects such as show animals or personal business) (1)
     % Placement (working for someone and getting paid (2)
     % Research (Agriculture Science Fair - testing a hypothesis) (3)
     % Exploratory (learning something new, without pay) (4)

Q17 Please indicate the Proficiency Areas for which your program had Placement SAEs for the 2012-2013 school year? (Please check all that apply)
- ❑ Agricultural Communication (1)
- ❑ Agricultural Education (2)
- ❑ Click to write Co Agricultural Mechanics Energy Systems (3)
- ❑ Agricultural Mechanics Design and Fabrication (4)
- ❑ Agricultural Processing (5)
- ❑ Agricultural Sales (6)
- ❑ Agricultural Services (7)
- ❑ Beef Production (8)
- ❑ Dairy Production (9)
- ❑ Diversified Agricultural Production (10)
- ❑ Diversified Crop Production (11)
- ❑ Diversified Horticulture (12)
- ❑ Diversified Livestock Production (13)
- ❑ Emerging Agricultural Technology (14)
- ❑ Environmental Science and Natural Resources Management (15)
- ❑ Equine Science (16)
- ❑ Fiber and Oil Crop Production (17)
- ❑ Floriculture (18)
- ❑ Food Science and Technology (19)
- ❑ Forage Production (20)
- ❑ Forest Management and Products (21)
- ❑ Fruit Production (22)
- ❑ Grain Production (23)
- ❑ Home and/or Community Development (24)
- ❑ Nursery Operations (25)
- ❑ Outdoor Recreation (26)
- ❑ Poultry Production (27)
- ❑ Sheep Production (28)
- ❑ Small Animal Production and Care (29)
- ❑ Specialty Animal Production (30)
- ❑ Specialty Crop Production (31)
- ❑ Swine Production (32)
- ❑ Vegetable Production (33)
- ❑ Veterinary Medicine (34)
- ❑ Wildlife Production and Management (35)

Q18   Does your program have Worked Based Learning SAEs (Cooperative Education or Placement)?
- ○ Yes (1)
- ○ No (2)

Answer If   Does your program have Worked Based Learning ... Yes Is Selected
Q19 Work Based Learning SAEs (Cooperative Education or Placement)
Total number of students participating (1)
Average income per student (total time they work up to 1 year) (2)

Q20 Do students in your program participate in the Research SAE component?
O Yes (1)
O No (2)

Answer If Do students in your program participate in the Resea... Yes Is Selected
Q21 Numbers of student SAEs in research projects:
Average time invested in each project (i.e. hrs) (1)
Total number of students participating (2)

Q22 Does your program have a Show Heifer SAE?
O Yes (1)
O No (2)

Answer If Does your program have a Show Heifer SAE?   Yes Is Selected
Q23 Show Heifer
Average expense to raise ONE Commercial Show Heifer (1)
Total number of Show Heifers for 12 months. (2)
Total number of students participating (3)

Q24 Does your program have a Show Steer SAE (single animal)?
O Yes (1)
O No (2)

Answer If Does your program have a Show Steer SAE (single animal)? Yes Is Selected
Q25 Show Steer
Average expense to raise ONE Show Steer (1)
Total number of Show Steers for 12 months (2)
Total number of students participating (3)

Q26 Does your program have a Breeding Beef Cattle Herd SAE?
O Yes (1)
O No (2)

Answer If Does your program have a Breeding Beef Cattle Herd SAE? Yes Is Selected
Q27 Breeding Beef Cattle
    Average expense to raise ONE Breeding Beef herd (all animals) (1)
    Total number of Breeding Beef herd for 12 months (2)
    Total number of students participating (3)
    Average Herd Size (# cows) (4)

Q28 Does your program have a Dairy Production SAE?
  ◯ Yes (1)
  ◯ No (2)

Answer If Does your program have a Dairy Production SAE? Yes Is Selected
Q29 Dairy Production
    Average expense to raise ONE Dairy Production (1)
    Total number of Dairy Production (individual animals) for 12 months (2)
    Total number of students participating (3)

Q30 Does your program have a Breeding Poultry SAE?
  ◯ Yes (1)
  ◯ No (2)

Answer If Does your program have a Breeding Poultry SAE? Yes Is Selected
Q31 Breeding Poultry
    Average expense to raise a PEN of Breeding Poultry (1)
    Total number of PENS of Breeding Poultry for 12 months (2)
    Total number of students participating (3)

Q32 Does your program have a show broiler program
  ◯ Yes (1)
  ◯ No (2)

Answer If Does your program have a show broiler program Yes Is Selected
Q33 Show Broilers
    Average expense to raise a PEN of Show Broilers (1)
    Total number of PENS of Show Broilers for 12 months (2)
    Total number of students participating (3)

Q34 Does your program have a Turkey SAE?
  ◯ Yes (1)
  ◯ No (2)

Answer If Does your program have a Turkey SAE? Yes Is Selected
Q35 Turkey

    Average expense to raise a PEN of Turkeys (1)

    Total number of PENS of Turkeys for 12 months (2)

    Total number of students participating (3)

Q36 Does your program have a Market Swine SAE?

O Yes (1)

O No (2)

Answer If Does your program have a Market Swine SAE? Yes Is Selected
Q37 Market Swine

    Average expense to raise ONE Market Swine (1)

    Total number of Market Swine (individual animals) for 12 months (2)

    Total number of students participating (3)

Q38 Does your program have a Breeding Swine SAE?

O Yes (1)

O No (2)

Answer If Does your program have a Breeding Swine SAE? Yes Is Selected
Q39 Breeding Swine

    Average expense to raise ONE Breeding Swine (1)

    Total number of Breeding Swine (individual animals) for 12 months (2)

    Total number of students participating (3)

Q40 Does your program have a Market Lamb SAE?

O Yes (1)

O No (2)

Answer If Does your program have a Market Lamb SAE? Yes Is Selected
Q41 Market Lamb

    Average expense to raise one Market lamb (1)

    Total number of Market lambs (individual animals) for 12 months (2)

    Total number of students participating (3)

Q42 Does your program have a Breeding Sheep SAE?

O Yes (1)

O No (2)

Answer If Does your program have a Breeding Sheep SAE? Yes Is Selected
Q43 Breeding Sheep Herd
    Average expense to raise one breeding sheep (1)
    Total number of breeding sheep herd for 12 months (2)
    Total number of students participating (3)

Q44 Does your program have a Market Goat SAE?
  ○ Yes (1)
  ○ No (2)

Answer If Does your program have a Market Goat SAE? Yes Is Selected
Q45 Market Goat
    Average expense to raise one market goat (1)
    Total number of market goats for 12 months (2)
    Total number of students participating (3)

Q46 Does your program have an Equine SAE?
  ○ Yes (1)
  ○ No (2)

Answer If Does your program have an Equine SAE? Yes Is Selected
Q47 Equine
    Average expense to raise one equine (1)
    Total number of equine (individual animals) for 12 months (2)
    Total number of students participating (3)

Q48 Does your program have an Aquaculture SAE
  ○ Yes (1)
  ○ No (2)

Answer If Does your program have an Aquaculture SAE Yes Is Selected
Q49 Aquaculture
    Average expense to raise one aquaculture SAE (1)
    Total number of pens/tanks for 12 months (2)
    Total number of students participating (3)

Q50 Does your program have a Horticulture SAE?
  ○ Yes (1)
  ○ No (2)

Answer If Does your program have a Horticulture SAE? Yes Is Selected
Q51 Horticulture

    Average expense of one Horticulture SAE (1)

    Total number of plants/projects for 12 months (2)

    Total number of students participating (3)

Q52 Does your program have a Floriculture SAE?

  ○ Yes (1)

  ○ No (2)

Answer If Does your program have a Floriculture SAE? Yes Is Selected
Q53 Floriculture

    Average expense of one Floriculture SAE (1)

    Total number of individual Floriculture SAE's for 12 months (2)

    Total number of students participating (3)

Q54 Does your program have a crop/forage SAE?

  ○ Yes (1)

  ○ No (2)

Answer If Does your program have a crop/forage SAE? Yes Is Selected
Q55 Crop/Forage Production

    Average cost of one Crop[/Forage Production SAE (1)

    Total number of individual Crop/Forage Production SAEs (2)

    Total number of students participating (3)

Q56 Does your program have an Ag Mechanics SAE?

  ○ Yes (1)

  ○ No (2)

Answer If Does your program have an Ag Mechanics SAE? Yes Is Selected
Q57 Ag Mechanics

    Average expense of one Ag Mechanics SAE (1)

    Total number of individual Ag Mechanics SAEs (2)

    Total number of students participating (3)

Q58 Please provide information on any SAEs excluded from this survey.

    SAE description (1)

    Average expense per unit? (2)

    Total number of individual SAEs in this area (3)

    Total number of students participating (4)