DISSERTATION

COLORADO'S SECONDARY SCHOOL PROGRAMS OF AGRICULTURAL EDUCATION: PERCEPTIONS OF SUSTAINABILITY

Submitted by

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WE HEREBY RECOMMEND THAT THE DISSERTATION PREPARED UNDER OUR SUPERVISION BY KELLIE JO ENNS ENTITLED "COLORADO'S SECONDARY SCHOOL PROGRAMS OF AGRICULTURAL EDUCATION: PERCEPTIONS OF SUSTAINABILITY" BE ACCEPTED AS FULFILLING IN PART REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY.

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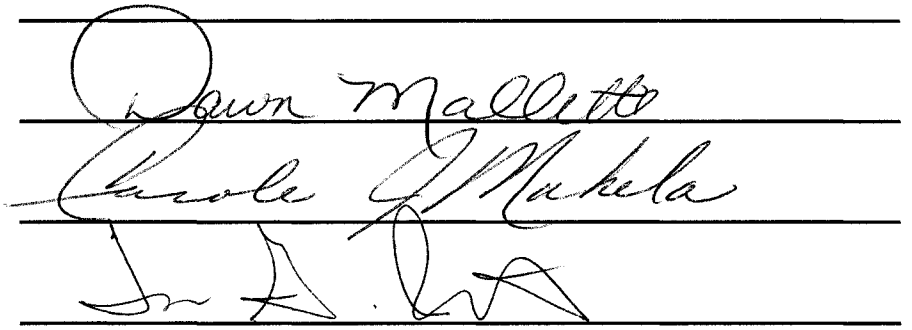

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ABSTRACT OF DISSERTATION

COLORADO'S SECONDARY SCHOOL PROGRAMS OF AGRICULTURAL EDUCATION: PERCEPTIONS OF SUSTAINABILITY

Agricultural education (Ag Ed) is faced with unique challenges; competition for scarce resources, teacher retention, and quality programmatic offerings are dilemmas within the profession. A rapidly changing agriculture industry and societal shift away from agrarian lifestyles complicates the Ag Ed culture. These challenges indicate it is a prudent time to study sustainability of Ag Ed in Colorado.

The purpose of the study was fourfold: first to understand if Colorado Ag Ed programs are perceived sustainable; second, to determine the characteristics of important resources in agricultural education; third, to determine the association of resources to program sustainability; and finally, to understand demographics that might predict sustainability. Knowledge of sustainability may help policy makers to develop models for programs consistent with state and national strategic growth initiatives.

Perceptions were gathered from three groups of Ag Ed stakeholders in the 2007-2008 school-year: teachers (n=96), administrators (n=64) and community members (n=65). Agricultural education in Colorado is perceived to be sustainable. Sustainability was ranked on a 10 point scale (1 = Very Sustainable to 10 = Very Unsustainable), M = 2.32, N = 204, SD = 1.37.

Program resources were characterized according to the perceptions of stakeholders. Utilizing Spearman's Rho statistic, the effectiveness of Ag Ed resources of Organization and Instructional Content (r_s=.399), FFA and Leadership Development (r_s=.305), SAE and Experiential Learning (r_s=.403), the Agriculture Teacher (r_s=.337), Program Management (r_s=.453) and Program Support (r_s=.454) were positively correlated to sustainability.

The Kruskal-Wallis test determined if differences existed in the three stakeholder groups perceptions of sustainability. The groups showed no significant differences regarding perception of Ag Ed program sustainability, χ^2 (2, N = 204) = 4.875, p =.087.

Demographic data and sustainability perceptions were utilized in a simultaneous multiple regression equation. The combination of variables to predict sustainability was statistically significant, $F(5,134) = 7.167$, p<.000. Demographic characteristics of School Enrollment, Ag Ed Enrollment, and Ag Industry Outlook significantly predict sustainability when all variables are included. The adjusted R^2 value was .172. This indicates that this model explains about 17 percent of the variance in sustainability.

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CHAPTER 1: INTRODUCTION

Background

Sustainability is the current "buzz" word; appearing almost everywhere. Taking its initial lead from the environmental movement, production agriculture practices, health care innovations, correctional facilities, school programs, water and land use practices, business organizations and even leadership roles have added to the sustainability research database.

What do we know about sustainability? While it is the focus of much attention, the concept of sustainability is disputed (Klosterman & Cramer, 2006), often causing confusion because many definitions are "sloppy ...or offer only slightly different" (Glavic & Lukman, 2007, p. 1875) variations to other existing definitions. It is in essence a moving target, continuously evolving as a concept (Warner, 2007). Due to the relative (Benz, Lindstrom, Unruh & Waintrup, 2004) and multidimensional (Bassett, 2005) nature, sustainability must vary from site to site (Blasinsky, Goldman & Unutzer, 2006; Benz, et al., 2004), making it difficult to operationalize (Klostermann & Cramer, 2006), and hence, to compare across studies or disciplines (Scheirer, 2005). Sustainability is often used interchangeably with institutionalization (Billig Sherry & Havelock, 2005), durability, maintenance and continuation (Scheirer, 2005). Sustainability requires a commitment to looking holistically (Timpson, Dunbar, Kimmel, Bruyere & Newman, 2006) at the interconnected nature of systems (Hartter & Boston, 2007). Sustainability is often related to the concept of quality (Warner, 2007).

Despite the differences cited in research, literature consistently shows that sustainability deals with resources: their availability, utilization and consumption (Hartter & Boston, 2007). Fullan (2005) reports "...balanced management of energy is key to sustainability. Overuse is burnout; underuse is atrophy (p. 37)." Resources, and their utilization, provide the background for a study of agricultural education sustainability. What resources exist for agricultural education?

The resources for Ag Ed are quality indicators. Three different sets of quality indicators for Ag Ed programs were combined to guide the framework: "Local Program Success Guide, Second Edition" (National Council for Agricultural Education, n.d.), "National Quality Program Standards for Secondary Agricultural Education" (National Council for Agricultural Education, 2007) and "Standards and Quality Indicators in Colorado Secondary Agricultural Education Programs" (Colorado Community College System, 2003). These documents reveal the resources to be studied: 1) Organization and Instructional Content, 2) FFA and Leadership Development, 3) SAE and Experiential Learning, 4) Agriculture Instructor 5) Program Management and 6) Program Support. Each of these resources has been the focus of research in agricultural education. Sustainability is holistic, and an adequate sustainability study in agricultural education must, therefore, holistically encompass all of these resources under one inquiry.

The contextual nature (Benz, et al., 2004) of sustainability also necessitates that that data be gathered from multiple viewpoints. The stakeholder's of most interest here are school administrators, agriculture teachers, and community members. Principals and local administrators of educational programs have authority over programs within the

school; teachers have influence over the richness of program implementation and motivation. Further, career and technical education (CTE) programs are greatly reflective of society and should be delivered under the auspices of community advisory members (Colorado Community College System, 2003). This research was done in a three-part survey, one for each of the stakeholder group that greatly influences Ag Ed and related program decisions. Survey research provided these multiple viewpoints in relatively efficient manner. This research provided a holistic and contextual lens, which to this point has not been adequately researched in the Colorado agricultural education.

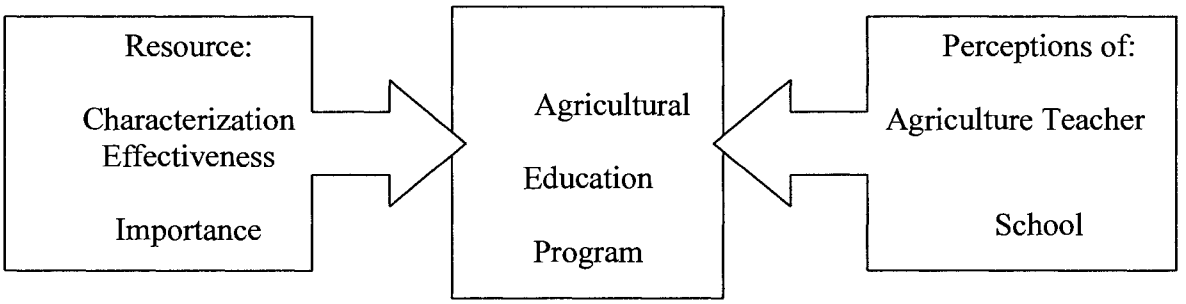

Figure 1.1: Framework for Ag Ed Program Sustainability Study

Statement of the Research Problem

Agricultural education is faced with complex and unique challenges; perhaps the greatest challenge is to grow quality programs to number 10,000 by the year 2015 (Team Ag Ed, 2007). Competition for scarce educational resources, teacher recruitment and retention, high-stakes testing and accountability, and quality programmatic offerings are dilemmas within the profession. A rapidly changing agriculture industry and societal

shift away from an agrarian lifestyle further complicates the agricultural education (Ag Ed) culture. Studying sustainability of Colorado's secondary agricultural education programs, given the evolving environments in which it exists, provides the necessary foundation for accomplishing the long term strategic goal of program expansion.

Purpose of the Study

The purpose of the study was four-fold: first to understand if Colorado Ag Ed programs are sustainable; second, to determine the characteristics of important resources in agricultural education, namely Organization and Instructional Content, FFA, SAE, the Ag Teacher, Program Management and Program Support; third, to determine the impact of these resources on program sustainability; and finally, to understand the demographics that might impact sustainability. Knowledge of sustainability may help policy makers to develop models for program growth consistent with the state and national strategic plans for growth of Ag Ed programs.

Research Questions

Data for this study was collected in December 2007. To this end, the research focused around the following questions:

1) (RQ1) What characterizes the following resources for agricultural education programs in Colorado?
    a) Curriculum Design and Instruction
    b) FFA and Leadership Development
    c) SAE and Experiential Learning
    d) Agricultural Teacher Characteristics

e) Program Management

f) Program Support

2) (RQ2) What is the association between the following resources and sustainability in Colorado agricultural education programs?

a) Curriculum Design and Instruction

b) FFA and Leadership Development

c) SAE and Experiential Learning

d) Agricultural Teacher Characteristics

e) Program Management

f) Program Support

3) (RQ3) Are the perceptions of agricultural education sustainability different between administrators, teachers, and community members?

3.1) Are the perceptions of resource effectiveness different between administrators, teachers and community members?

3.2) Are the perceptions of the essentiality of resources different between administrators, teachers and community members?

4) (RQ4) What is the association between the following identifying demographics and sustainability in Colorado agricultural education programs?

a) Length of Time Affiliated with Current School

b) Length of Time in Profession (Teacher and Administrator only)

c) Rural and Non-rural School Districts

d) High School Enrollment

e) Agricultural Education Enrollment

f) FFA District

g) Perception of the Agriculture Industry

To further assist in the analysis of these questions the following null hypothesis were employed:

1) There are no associations between the following resources and sustainability in Colorado agricultural education programs (RQ2):
    a) Curriculum Design and Instruction,
    b) FFA and Leadership Development,
    c) SAE and Experiential Learning,
    d) Agriculture Teacher Characteristics,
    e) Program Management, and
    f) Program Support.
2) There are no differences in perceptions of agricultural education sustainability among three stakeholder groups (administrators, teachers, and community members) (RQ3).
3) There are no differences in the perceptions of agricultural education resource effectiveness among three stakeholder groups (administrators, teachers, and community members) (RQ3.1).
4) There are no differences in the perceptions of agricultural education resource importance among three different stakeholder groups (administrators, teachers and community members) (RQ3.2).

5) There is no predictability of sustainability in Colorado Ag Ed from the following demographics (RQ4):
    a) Length of Time Affiliated with Current School,
    b) Length of Time in Profession (teacher and administrator only),
    c) High School Enrollment,
    d) Agricultural Education Enrollment,
    e) Perception of Agriculture Industry.

Definition of Terms

The definitions that follow will provide the general parameters of the study. A more thorough explanation and literature support for the following definitions can be found in chapter two.

Agricultural education: "Agricultural education is the educational process which promotes knowledge, skills, and attitudes in agriculture (occupationally- oriented) and about agriculture (non-occupationally oriented) to a diverse clientele of all ages, inclusive of all populations by utilizing structured and non-structured delivery systems" (Colorado Community College System, 2003 p. 1)

Colorado Secondary Agricultural Education Program: approved programs in Colorado offered in grades 9-12 that are operating under the auspices of the Colorado Community College System and are in compliance with the Colorado Vocational Act. Those programs delivering instruction in agriculture content in the classroom and laboratory, leadership development through the FFA, and Supervised Agriculture

Experience (SAE) are considered to be offering a "total program" of agricultural education (S. Stump, personal communication, October 3, 2007).

Sustainability: Agricultural education sustainability is the extent that a program is "endurable, livable, adaptable and supportable" (Akerland, 2000, p. 354). It is reflective of the local community and is dependant on the resources utilized within the program.

Resources: Resources are those items that are required to achieve educational goals (Koski & Weis, 2004). Specifically for this study the resources to be investigated are: Organization and Instructional Content, FFA, SAE, agriculture teacher, program management and program support.

Organization and Instructional Content: Practices related to the effective organization and delivery of instruction in Ag Ed. For this study, Organization and Instructional Content includes: program and instructional design, instruction practices, facilities and equipment and assessment.

Supervised Agricultural Experience (SAE): "Practical agricultural activities of educational value conducted by students outside of the regular class or laboratory instructional time for which systematic instruction and supervision are provided by the teacher, parent, employer and others" (National Council for Agricultural Education, 2007, p. 64).

FFA: Year-round, intra-curricular student organization (National Council for Agricultural Education) for individuals enrolled in secondary agricultural education. FFA prepares students for premier leadership, personal growth and career success (National FFA Organization, 2007).

Program Management: Those factors that relate to management and administration of an agricultural education program including: marketing, partnerships, program organization, planning and evaluation, and advisory committees.

Program Support: Those entities that deliver technical, volunteer and financial support to a secondary agricultural education program in Colorado. Support may be internal to the education system (within the operations of the school district, guidance and counseling for example) or external (community based).

Finally, this study will utilize a three-part survey. Input was sought from the following stakeholders:

Agricultural education instructor: Individuals employed primarily as instructors of agriculture in secondary schools in Colorado.

Community members: Individuals, typically members of the agricultural education advisory committee, who are familiar with delivery of agricultural education programs in Colorado. Agriculture instructors were asked to submit names and contact information of their advisory committee.

Administrator: Individuals within school districts with primary responsibility for the coordination and delivery of secondary career and technical education programs. This individual may be the superintendent, principal or career and technical education administrator. These individuals will be nominated by the local agriculture instructor from the respective schools.

Delimitations

Data for this study was collected in Colorado in December of 2007. While the concepts in this research may have applicability to other states and to other educational programs, the findings pertain directly to Colorado agricultural education programs and associated resources. Stakeholders were surveyed for their perceptions related to program sustainability. The researcher realizes that surveyed stakeholders are only a fraction of the perceptions that could be collected, but due to time and financial constraints, the sample is restricted to one administrator, the agriculture teacher(s), and two community members from each of the local programs in Colorado. For the purposes of this study, the restrictions are the resources integral to Ag Ed in Colorado that are expressed in the research questions.

Significance of the Study

The environmental policies, production agriculture practices, public service innovations, business organizations and even leadership roles have been well documented in sustainability research. Likewise, individual program entities in agricultural education are well documented in research. To the researcher's knowledge, this holistic view of Ag Ed sustainability has not occurred within the frame of one study.

Currently, very few studies have focused on the total program approach to agricultural education, and any data that does exist is not specific to Colorado. One previous dissertation study on Colorado Ag Ed was conducted in 1994 which researched the philosophy of the vocational nature of the agricultural education programs; and used a similar three-part survey design. This study provided useful background on Ag Ed in

Colorado, yet did not research perceptions of sustainability of agricultural education, or those resources which aid sustainable programs, the focus of this research design. A study of this nature and scope will add to the current research in sustainability and agricultural education, and will provide a valuable bridge between these two paradigms.

Researcher's Perspective

The investigator for this study holds a professional teacher license for secondary agriculture and a credential for Career and Technical Education in the areas of agriculture production, horticulture, farm and ranch management and local CTE director. The investigator has spent nine years teaching in the secondary classrooms and four years as a local career and technical education administrator. The researcher has also served the capacity of instructor at Colorado State University training pre-service teachers for a career in agricultural education. This experience has been extremely valuable in providing insight and passion for this study as well as the practical experience in the profession. Needless to say, the researcher is hopeful that agricultural education is sustainable and that growth of agricultural education outlined in the long-range strategic plans is achievable.

As such, the great challenges inherent in Ag Ed in 2008 are the cause of much reflection for this researcher. It is a crucial time for consideration of Ag Ed sustainability. A stakeholders' view of the value provided by Ag Ed and its resources, could project a model of Ag Ed sustainability into the throws of the current education climate. What is it that is valued? What resources need embraced or enhanced? How can Ag Ed survive in an era of diminishing educational resources, accountability, and change? Reliable data

from this investigation could provide a vehicle for Ag Ed sustainability; and hence provide information to accomplish both a quality and growth initiative presented by the long-term strategic goal of the profession.

CHAPTER 2: REVIEW OF LITERATURE

Introduction

Change is rapidly occurring in agriculture and education. From the inception of agricultural education to present day, countless policies and reforms have transformed the educational climate, the most recent being a push for standards and accountability with the passing of the Elementary and Secondary Education Act of 2001 (known as the No Child Left Behind Act, or NCLB) and increasing competition for educational funds.

Changes have also occurred in the agriculture industry. Production capabilities enable agriculture, an industry that previously provided food for a family, to now produce for 129 other people (Agriculture Council of America, 2006). While fewer individuals are directly involved in actual production agriculture, 17 percent of the domestic workforce is engaged in 300 careers related to producing, processing, marketing, distributing and management of food, fiber and natural resources (Agricultural Council of America, 2006; Loudenslager, 2006 citing U.S. Department of Agriculture statistics). Rapid advances in technology and innovative techniques have changed the issues and climate of today's agriculturalist. Agriculture is focused on issues related to the environment, food supply and safety, and trade (Stewart, Moore & Flowers, 2004); trends only imagined by the previous generations of agriculture producers. From mechanization and technology to the removal of the farm lifestyle from the vast majority of population, agriculture continues to see rapid changes and developments as an industry; at no time in history have the changes in agriculture been more rapid than they are currently (Stewart, Moore & Flowers, 2004; Norris & Briers, 1989).

In schools in the 1800's, agricultural education was an essential component of the general curriculum, taught to all students, when agrarian life was lived by a majority of the population. Agriculture courses in schools were sustainable because the clientele necessitated the training of current and future agriculturalists. Does agricultural education continue to be sustainable with widespread changes in education and agriculture? This literature review will provide grounding for this question in two ways: first a review sustainability and development of a framework of sustainability, then, through a discussion of agricultural education and where it fits within this framework.

Sustainability

According to Akerland, (2000), sustainable programs are those that are "endurable, livable, adaptable and supportable" (p. 354). While sustainability is everywhere in research literature and mainstream periodicals, it isn't found in agricultural education research. Therefore, the conceptual framework for sustainability must be gleaned from other areas, looking most closely at studies that define sustainability and the parameters that make up sustainability. From literature, two main themes evolve about sustainability: 1) sustainability is contextual and system dependent and 2) sustainability is resource driven.

Sustainability is *Contextual and is System Dependent*

Sustainability is an important concept for many organizations, innovations, and local agricultural education programs, however, due to its dependence on local culture, it will often look different in each location (Blasinsky, Goldman, & Unutzer, 2006; Billig, Sherry & Havelock, 2005). Benz, Lindstrom, Unruh and Waintrup (2004) studied

sustainability in special education transition programs and described the contextual issue of sustainability as being a mutual adaptation process where the school, community and innovation (or education program) adapt to one another. Billig, Sherry and Havelock (2005) concur in their study of Challenge 98, a regional technology initiative in Texas. They state that sustainability is dependent upon the macro-culture development; specifically accepted norms, rituals, and symbols that help promote identity and relevance of the innovation into the system. Benz et al (2004) reported that while the processes of programs are similar, sustainability can look quite different depending on location. Flexibility, therefore, is essential to sustainability as it allows a program to niche itself into the local environment. Key stakeholders provide valuable insight into this process. "The perspectives of key stakeholders likewise can influence sustainability through their concerns about the nature and effectiveness of the innovation, and how well the innovation fits within the culture of the district and school" (Benz, et al, 2004 p. 42).

Glavic and Lukman (2007) define a sustainable system as "a group of interdependent and interrelated subsystems comprising a coherent entity" (p. 1876). If an innovation fails, it is because the innovation failed to alter the organization and its members – it failed to provide a necessary service (Schneider, Brief & Guzzo, 1996).

Sustainability is Resource Driven

Seldom do you read research on sustainability that doesn't contain the word resource. Depending on the program, industry, or innovation that is studied, this word, resource, can take on many different meanings, although rarely in literature is the word aptly defined. Studies pertaining to the environment or "green" movement often utilize

resource to mean natural resources, and their consumption and pending depletion (Glavic & Lukman, 2007; Hartter & Boston, 2007; Stead & Stead, 2000). For the purposes of this study, we will discuss resources in a similar way as Koski and Weis (2004) who said that resources are those items that are required to achieve student mastery of the content standards or educational goals. Resources, specific to this study, are human resources, quality indicators, and support networks.

Human resources.

Many studies in sustainability mention the importance of people. Miles (1983) studied institutionalization (another word for sustainability) in 12 schools (rural, suburban, and urban) in 10 different states and found that high degree of institutionalization occurred for two main reasons: a mandate from a powerful central administrative force, or a highly energized support network to assist in building commitment to the innovation or program. Sustainability, according to Miles (1983) required that people carried the torch or provided the pressure. Other studies concur; sustainability requires strong leadership in order to champion the cause (Billig, Sherry & Havelock, 2005; Fullan, 2005; Harris, Henry, Bland, Starnaman & Voyek, 2003; Miles, 1983).

The human resource issue is especially critical in an era where school leadership and teacher exodus are commonplace. Colorado is experiencing approximately 20 percent turnover in agriculture teachers each year (S. Stump, personal communication, November 14, 2007). Staff retention in schools provides avenues for sustainability, whereas the turnover of staff can prevent mastery of essential skills necessary to promote the

innovation (Blasinsky, Goldman & Unutzer, 2006; Miles, 1983). Likewise, Benz, et al. (2004) discussed that stable staff and support of one key administrator was important to the successful sustainability of the transition program they studied. Schneider, Brief and Guzzo (1996) respond: "Organizations as we know them *are* the people in them" (p. 9) and further state, "through interactions and interpretations, employees form perceptions. These perceptions constitute the climate to sustain implemented change" (p. 12).

The human resource component was also present in other sustainability studies outside of education. In Klostermann and Cramers' (2006) work on sustainability in Dutch water companies, the actual perceptions of sustainability of the individual stakeholders impacted the strategies for implementation. For Ball and Wiley (2005) sustainability of the family farm was distinctly related to aspirations of young people to devote themselves to farming and rural lifestyle. The human element was integral to each study of sustainability reviewed for this project. The human resource component was vital in the study of sustainability as viewpoints from multiple stakeholders informed the results.

Quality indicators.

A program is only sustainable if it meets the intended program requirements. Therefore, program standards and quality indicators are the principal resources utilized in sustainability. Three studies emphasized this concept.

Blasinsky, Goldman and Unutzer (2004) studied sustainability of project IMPACT, a collaborative care intervention, and defined sustainability as the degree that

the IMPACT model was continued. A primary facilitator to sustainability in this study was model effectiveness; the ability of the model to document positive client outcomes.

For Benz, et al. (2004) the definition of program sustainability was the degree that the five essential features of the special education transition program were integrated. In this perceptions study, results showed that the program served a clear role in the district and the program showed a positive impact on student outcomes.

Warner (2007) describes sustainability and quality as being intertwined. In his study of partnerships producing California winegrapes, sustainability was a process to producing a crop that yielded high environmental quality and high wine quality. The process consisted of "grafting sustainability practices into existing quality initiatives... into a marketing advantage."

In addition to these three studies, other research also mentioned a quality component as being essential to sustainability. Billig, Sherry and Havelock (2005) cited previous work by Billig (2002) where a framework for sustainability was developed based upon 17 organizations that were able to maintain educational innovations. In their work, the innovation must have shown credibility; have been mutually beneficial for participants and partnerships. These quality factors impact sustainability.

A similar philosophy exists in current educational accountability movements. If a student reaches a particular standard, then the system has performed correctly. The idea is that programs of high quality (meaning reaching standards) are much more apt to be supported and sustained. Quality, however defined by the project or innovation, must be a focus for sustainable practices. Quality in Colorado agricultural education is based upon

implementation of program standards and quality indicators (Colorado Community College System, 2003).

Support networks.

Support networks have a large impact on sustainability. Support networks may be relationships, funding sources, incentives (such as professional development) or other activities that increase the capacity of the system. Regarding educational innovations, supporting resources often deal with finances and securing long-term funding for innovations that were first developed through grants and initiatives (Basset, 2005; Billig, Sherry & Havelock, 2005). Not only is there a concern that there is sufficient funding, but that the innovation is able to generate and leverage resources as well (Billig, Sherry & Havelock, 2005). Support not only comes with financial resources, but also through building partnerships with other agencies and stakeholders (Warner, 2007). Sustainable programs are community based and community owned (Akerland, 2000; Howley & Harmon, 1996). Community resources not only provide an area of outreach, but can also provide important expertise. Billig, Sherry and Havelock (2005) report that sustainability is often the result of hard work – work aimed at maintaining support of leaders and advisory boards through a product that has high visibility.

Sustainability is dependent upon the context in which it exists and also the resources it has. It is important, then, to discuss agricultural education through a similar lens.

Career and Technical Education

Agricultural education exists in a larger context of vocational education, a synonymous phrase with Career and Technical Education (CTE). Enjoying a rich history in American education, CTE programs are organized education systems offered in a sequence of courses directly preparing individuals for employment (Gordon, 2003). Almost 90 years ago the federal government committed to vocational education by passing the Smith-Hughes National Vocational Education Act. This act clearly dedicated the programs under it to eternal debate on their vocational nature; while also prioritizing the preparation of students for a globally-competitive workforce (Silverberg, Warner, Fong & Goodwin, 2004). While the place for CTE in American education continues to evolve, statistics show that CTE has benefits for students, schools and communities which assist in long-term sustainability of CTE programs.

CTE programs are based on trends in society (Balamuralikrishna & Dugger, 1995), meet local community, state and global needs, and provide needed relevance and significance for students (Colorado Community College System, 2005). Nearly every student (96.6 percent) leaves high school having taken some vocational education (Silverberg, et al., 2004) and for Colorado over 103,000 secondary students were enrolled in approved CTE programs in the 2004-2005 school year (Colorado Community College System, 2005).

CTE research shows many positive outcomes including increasing student relevance and motivation and increasing the persistence of high-school students to

graduation. Further, graduates are more likely to be employed while pursuing post-secondary education and will have higher earnings in the future (Association for Career and Technical Education, n.d.; Association for Career and Technical Education, 2006; Silverberg, et al., 2004).

Agricultural Education in Colorado

Annually the agriculture industry generates 105,000 jobs and contributes $15.9 billion to Colorado's economy. Colorado ranks 16th nationally in cash receipts from farm marketing's; outranked in the west only by California (United States Department of Agriculture, National Statistics Service, n.d.). Agriculture's rich history and economic impact in Colorado implies that agricultural education programs should be highly sustainable, yet enrollment in Ag Ed in Colorado has been relatively stable over the last five years with a slight decrease in the number of secondary programs (Colorado Community College System, 2005). Colorado has an average student enrollment (over 5 years) of 4,543 in 97 programs (Colorado Community College System, 2005).

Three-part delivery.

Agricultural education, from its formal beginnings with the passing of the Smith-Hughes Act of 1917 (also known as the National Vocational Education Act) until the present has been delivered in an integral, three-part instructional model: 1) classroom/laboratory instruction, 2) experiential learning (through the Supervised Agricultural Experience (SAE) Program) and 3) leadership development (delivered through the FFA student organization). The three-interlocking circles (Figure 2.1.) represent the essential components of a total agricultural education program and provide

the best context for student acquisition of knowledge and skills (Talbert, Vaughn, Croom, 2005). "Each component makes a unique contribution to teaching and learning while complementing the other two" (Dyer & Williams, 1997 p. 50).

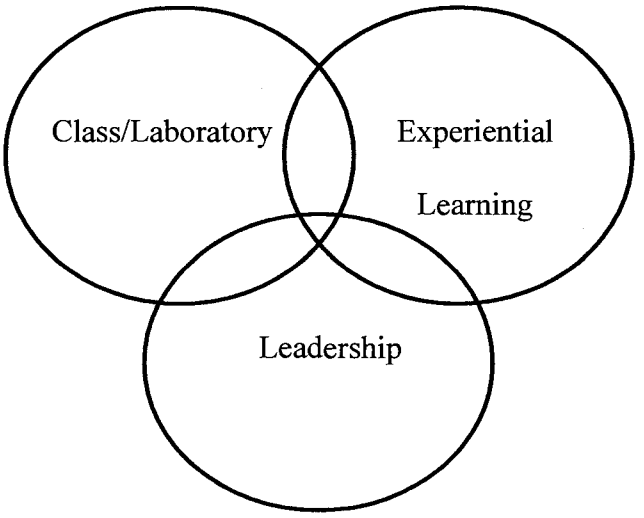

Figure 2.1. Three Integral Components of Ag Ed

Classroom and laboratory instruction.

The first of the three interlocking circles pertains to the delivery of content within the structured environments of the classroom and laboratory and the design and sequence of this delivery. Originally and by definition, Ag Ed is first and foremost about training individuals for careers in agriculture (Colorado Community College System, 2003). A 1989 study found that administrators believed in the vocational nature of the program, and that the training of students for gainful employment in agriculture occupations was very important (Jewell, 1989). However, a few years later, Hughes and Barrick (1993) recommended that Ag Ed should be more than just job preparation and should model the

change happening in the industry. Agriculture literacy and educating all students to become informed consumers of agriculture products (Kahler, 1988) became the focus of agricultural education instead of specific occupational training in agriculture. A timely quote by Hughes and Barrick (1993) reflected the goals of the Ag Ed as "to increase agriculture knowledge, develop employability, leadership and personal skills, promote life-long learning and effectively integrate all components into the community as productive citizens" (p. 64). The most recent philosophical shift in Ag Ed is the result of the movement for standards and accountability; changing the focus of agricultural education to reflect academic standards; the easiest academic collaboration is between science and agriculture (Eaton & Bruening, 1996).

Broadening of the scope of Ag Ed has not changed the method of delivery of most Colorado Ag Ed programs. Half of the programs still teach in a predominant production format called the cross-sectional approach, where content is delivered across all content areas in classes from Ag I, Ag II, Ag III and Ag IV (for the four year student) (Scott Stump, personal communication, March 2, 2007). The remaining half of the programs are delivered along content specialties (called pathways), in which each class is delivered with an in-depth study of the content, in areas such as agribusiness systems, or animal and plant systems (Colorado Career Cluster Model, 2007). There continues to be debate in Colorado over the best method of delivering the ag content, as many of the programs are single teacher programs where teaching multiple classroom preps along pathways can be challenging.

Experiential learning and supervised agriculture experience.

John Dewey, the founder of pragmatism and the theory of "learning by doing," was the inspiration which led to the development of the SAEP; the second parameter of this research. Supervised programs are "practical agricultural activities of educational value conducted by students outside of the regular class or laboratory instructional time for which systematic instruction and supervision are provided by the teacher, parent, employer and others" (National Council for Agricultural Education, 2007, p. 64). Essentially, the SAE is a way for each student to have an individual, out of class, experience that enhances the learning that occurs in the confines of the classroom (Cheek, Arrington, Carter & Randall, 1994). The value of SAE programs, as stated by Hughes and Barrick (1993), is that it allows students of varying ability levels, aspirations, and backgrounds to successfully participate in agriculture programs.

Originally, SAEs represented primarily production agriculture programs where student would raise and market their own livestock, crop or related commodities. The scope of the SAE has now been broadened to include job placement experiences, research and entrepreneurship experiences, and exploratory exercises as well as service learning opportunities (National FFA Organization, 2006).

Experiential learning is certainly not unique to agricultural education and research documents the benefits of this teaching technique. Experiential learning activities are often the favorite of students (Weaver, 1998) and engage students more fully in the content (Scales, Roehlekepartain, Neal, Kielsmeier, Benson, 2006; Weaver, 1998). Experiential education can provide needed relevance to the curriculum (Cheek, et al.,

1994; Duster & Waters, 2006; Ives & Obenchain, 2006) and can increase perceptions of usefulness, value and empowerment to the participating individuals (Scales, et al., 2006). Students engaging in experiential learning may also increase academic achievement, show increase in higher order thinking skills, greater depth of information processing and recall, receive higher grades, have better attendance and lower drop out rates (Duster and Waters, 2006; Ives & Obenchain, 2006; Scales, et al., 2006; Weaver, 1988). Experiential education may contribute to higher academic achievement and be developmentally responsive to students by assisting them in developing skills for problem-solving and critical thinking (Ives & Obenchain, 2006; Scales, et al. 2006).

Ives and Obenchain (2006) define three parameters for successful implementation of experiential learning activities: 1) learning opportunities should be student-directed, 2) learning must connect to the real world and 3) critical reflection is essential to the success. SAEs in agricultural education provide these three critical elements.

Successes of experiential learning, and especially SAE programs, lie with the ability of the teacher to construct, deliver, and supervise effective curriculum (Ives & Obenchain, 2006; Swortzel, 1996). While agricultural educators are supportive of SAE programs, they often fail to utilize SAE programs as intended (Dyer & Osborne, 1995). The difficulty of implementation and supervision as well as a lack of national focus for a definition of a quality SAE has led over the years to a substantial decline in participation. Nevertheless, SAE continues to be included as a part of a quality agricultural education model.

Leadership development and the FFA

The third circle of the three-part agricultural education model is leadership development and the FFA. "The Quality Indicators for Colorado Secondary Agricultural Education Programs" (Colorado Community College System, 2003) state that leadership development will be integral to the instructional program of agricultural education (Colorado Community College System, 2003). Talbert, Vaughn and Croom (2005) describe the FFA leadership component as a "connecting activity that establishes relationships between school and life" (p. 108).

The FFA is perhaps the most well researched area of agricultural education. Leadership development, and specifically FFA, has been shown to contribute to undergraduates' success in college as former FFA members are more engaged in school and community activities (Park & Dyer, 2005; also citing Balschweid & Talbert, 2000). Leadership development and FFA have shown to influence educational outcomes such as student achievement, skill attainment and student retention (Ball, Garton & Dyer, 2001; Dyer, Breja & Andreasen, 1999; Dyer, Lacey & Osborne, 1996). Students with backgrounds in agriculture youth leadership organizations are so valuable that colleges and universities are recommended to utilize this as a primary recruitment tool (Ball, Garton & Dyer, 2001; Park & Dyer, 2005). Benefits of the FFA are not just perceived by others, but former FFA members themselves view the FFA as being instrumental in helping them to choose a career and achieve their educational goals (Croom, D.B. & Flowers, 2001). Croom, B. and Flowers (2001) state the role of the FFA in student development as:

> At an age when more students are becoming eligible for FFA members, they are also entering a period of human growth and development characterized by a need for contact, intimacy, a sense of belonging and achievement. The implications are significant for the FFA and agricultural education in that students tend to join and participate in the FFA based upon the organization's ability to meet a student's need for self-esteem. The FFA should continue to seek ways to involve all members in positive personal growth activities that allow students to experience that sense of belonging (p. 16).

The three-part delivery of agricultural has been touted as "genius" (Loudenslager, 2006) and a model for many other disciplines to copy. It allows that a student, while needing to learn in all areas of the model, can find a way to personally connect to the curriculum (classroom and laboratory), develop a personal program to apply the skills (SAE), and get recognition for their efforts (through FFA) and increase personal development skills.

The three-part model has served the profession well, but the obligations for program facilitation are great, and take extraordinary tolls on the instructors. Concerns exist regarding whether the three-part delivery is currently being done, and if so, if the three-parts are truly equal as the model was designed. Research has repeatedly confirmed that beginning teachers do not feel competent to implement all phases of the program (Garton & Chung, 1996; Ricketts, Duncan, Peake & Uesseler, 2005), and hence may limit the degree of implementation on the local level. Roberts and Dyer (2004) verify this as well as the implications for teacher preparation by stating,

> Creating effective agriculture teachers is imperative for the long-term sustainability of agricultural education programs. Ineffective teachers are likely to become dissatisfied....and if ineffective teachers remain in classrooms, anecdotal evidence suggests that programs close and countless students will not have an opportunity for education in agriculture" (p. 94).

Agricultural Education in Sustainability Framework

In the sustainability framework presented earlier in the literature review there were two main themes to sustainability: 1) sustainability is contextual and system dependent and 2) sustainability is resource driven. In order to assess the contextual nature of agricultural education, this research will ask for perceptions of primary stakeholder's in agricultural education through surveys. In order to assess the resources in agricultural education present in the survey, many studies and handbooks were evaluated. Three documents were selected to assemble resources to survey. These documents were selected because of their fit into the resource framework presented earlier (human resources, quality indicators and support networks). The three documents are: "Local Program Success Guide, Second Edition" (National Council for Agricultural Education, n.d.), "National Quality Program Standards for Secondary Agricultural Education" (National Council for Agricultural Education, 2007) and "Standards and Quality Indicators in Colorado Secondary Agricultural Education Programs" (Colorado Community College System, 2003). These documents reveal the resources to be studied: 1) Organization and Instructional Content, 2) FFA and Leadership Development, 3) SAE and Experiential Learning, 4) Agriculture Instructor 5) Program Management and 6) Program Support (Figure 2.1). Each of these documents were evaluated and consolidated to fit the resource model of this study. Figure 2.2 summarizes the conceptual model of the resources in Ag Ed.

Critical Timing of Sustainability Study

While agricultural education has had a long history in the American education system, there are challenges which threaten its long-term survival. Anecdotally, teaching academic skills in an applied setting, such as in CTE programs and Ag Ed programs, should assist in students receiving a deeper understanding of the content. However, research has shown that these programs as a whole have a negligible effect on academic achievement and in fact, "on average, taking vocational courses does not 'add value' to academic achievement as measured by test scores" (Silverberg, et al, 2004, p. 7). Further, while federal funding provides only a small share of necessary operating funds, there are consistent threats to the federal set-aside dollars for CTE programs each time the Perkins Act is up for reauthorization (every five years). Anticipated cuts in state or federal funding may have a significant impact on implementing a high-budget program (Balamuralikrishna & Dugger, 1995). This issue is very real to agricultural education programs as they are the highest cost of all approved CTE programs in Colorado (Colorado Community College System, 2005). In addition, nationally 84 percent of all secondary agriculture programs are offered in towns and rural areas with populations of less than 1,000 people per square mile (Team Ag Ed, 2006); areas which often do not have a substantial tax base to adequately assist school funding. In Colorado many ag ed programs have closed in rural areas where school funding is tied to declining enrollments and the high cost of programmatic offering have prevented continuation (Tim Anderson, personal communication, February 23, 2007).

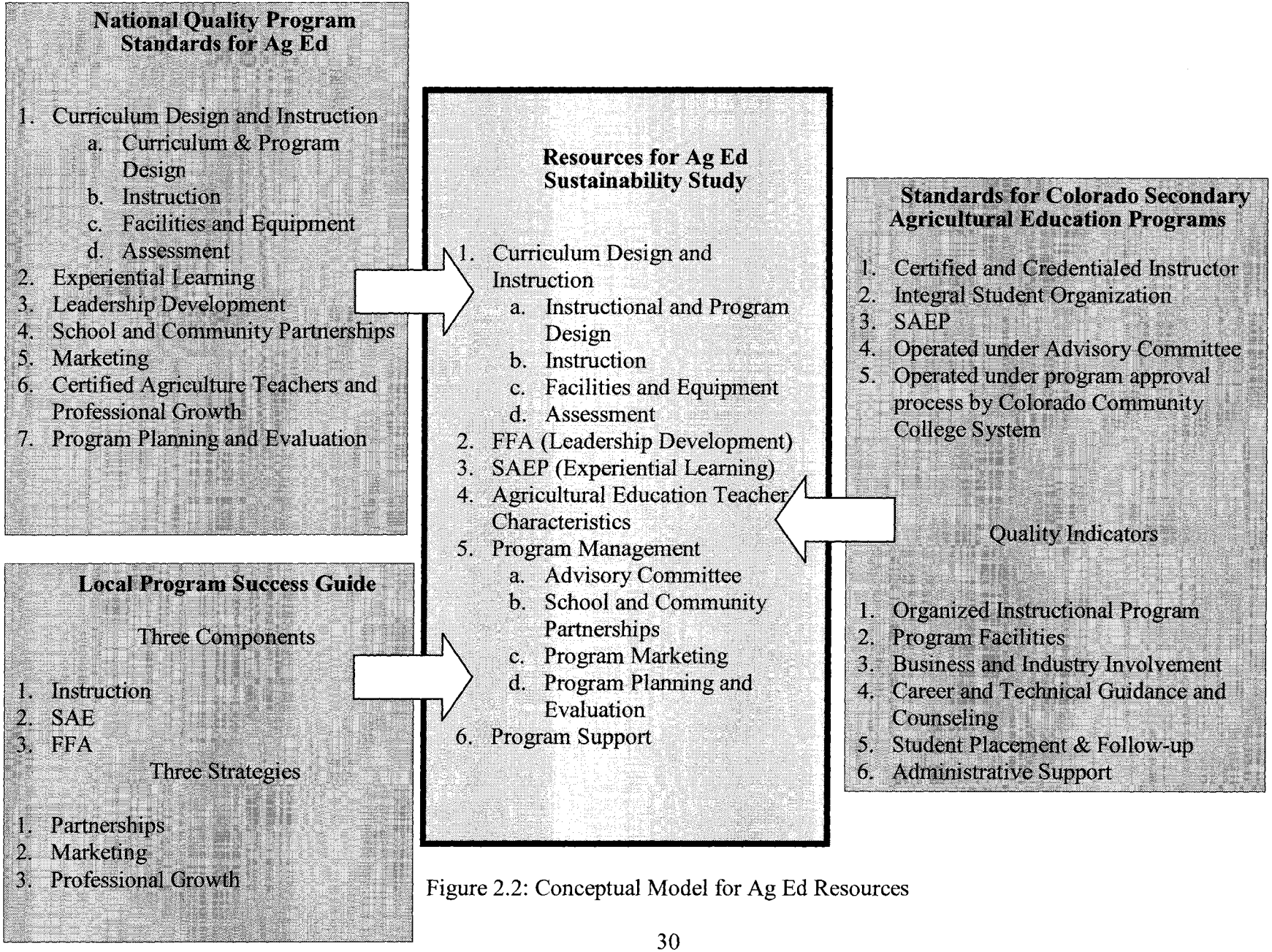

Figure 2.2: Conceptual Model for Ag Ed Resources

Yet, with all of these issues, there is a move at the state and national levels to expand programs and program offerings. Colorado proposes a 49 percent growth in new programs by 2010 (Colorado Team Ag Ed, 2006) and the long range strategic goal at the national level is to have 10,000 quality programs by the year 2015 (Loudenslager, 2006), up from 7,242 programs offered in the 2005-2006 school year (Team Ag Ed, 2006).

The growth initiative is an interesting charge to those in agricultural education when CTE programs are struggling in many local areas. The goal of this study is to determine the sustainable value of agricultural education in Colorado and to develop a model for program growth where Ag Ed is integral to the education environment. Most valuable to this research is the understanding of resources in agricultural education programs which are sustainable. This research can hence provide momentum to guide a transition or change process or a growth initiative as proposed.

Change and reform is the result of many things including turnover in leadership, changes in philosophy and differing goals (Bonner, Koch & Langmeyer, 2004), and policy implementation and feedback from valuable stakeholder groups (Whittington, 2005). All of these situations have occurred in Colorado in the last 20 years due to a rapidly evolving education climate and rapid changes in the agriculture industry (Stewart, Moore & Flowers, 2004; Vamadore & Iverson, 1991). There has additionally been substantial teacher turnover in local programs and there are new individuals in statewide leadership positions. It is therefore a critical time to study agricultural education resources and their impact on sustainability.

CHAPTER 3: METHODOLOGY

Introduction

This chapter presents the research design and rationale, selection of participants, description of the instrument, procedures for data collection and analysis of the data. A summary of the methods cross referenced to the research questions can be found in table 3.1.

To adequately guide the inquiry and corresponding method, it is important to review the purpose of this study. The purpose of the study was four-fold: first to understand if Colorado Ag Ed programs are sustainable; second, to determine the characteristics of important resources in agricultural education, namely Organization and Instructional Design, FFA, SAE, the Ag Teacher, Program Management and Program Support; third, to determine the impact of these resources on program sustainability; and finally, to understand the demographics that might impact sustainability. Knowledge of sustainability may help policy makers to develop models for program growth consistent with the state and national strategic plans for growth of Ag Ed programs.

Research Design

A combination of descriptive, comparative and associational research approaches was used in this study (Table 3.1) Data was collected from multiple stakeholder groups through web-based and mailed survey instruments. Respondents were asked to respond to a survey containing eight parts to ascertain the characteristics of the resources of Ag Ed and to provide perceptions of sustainability on Likert-type scales.

Table 3.1:

Cross-walk of Research Questions to Research Methodology

Research question	Section of Instrument	Form of Data	Form of Data Analysis
1. What characterizes the following resources for agricultural education programs in Colorado? a) Organization and Instructional Content b) FFA and Leadership Development c) SAE and Experiential learning d) Agricultural Teacher Characteristics e) Program Management f) Program Support	Section 2-7 – Resource Data	Ordinal	Descriptive Analysis Reported as frequency tables, means and standard deviations (where appropriate)
2. What is the association between each of the following resources and sustainability in Colorado agricultural education programs? a) Organization and Instructional Content b) FFA and Leadership Development c) SAE and Experiential learning d) Agricultural Teacher Characteristics e) Program Management f) Program Support	Section 2-7 – Resource Data Section 8 – Sustainability Data	Section 2-7 - Using Ordinal Data of "Effectiveness" and "Essentiality" Section 8 – Ordinal data which indicates "Sustainability"	Associational Analysis Correlations Independent Variable(s) are responses to ranks of resources Dependent Variable is Response to Sustainability Question

Table 3.1:

Cross-walk of Research Questions to Research Methodology (continued)

Research question	Section of Instrument	Form of Data	Form of Data Analysis
3. Are the perceptions of agricultural education sustainability different among administrators, teachers, and community members? 3.1 Are the perceptions of resource effectiveness different among administrators, teachers and community members? 3.2 Are the perceptions of the essentiality of resources different among administrators, teachers and community members?	Section 1 – Demographic Data Section 8 – Sustainability Data	Section 1 – Nominal Section 8 – Ordinal	Difference Analysis Kruskal-Wallis (non-parametric) Mann Whitney post hoc tests
4. What is the association between each of the following demographics and sustainability in Colorado agricultural education programs? a) Length of Time Affiliated with Current School b) Length of Time in Profession (Teacher and Administrator only) c) High School Enrollment d) Agricultural Education Enrollment e) Perception of the Agriculture Industry	Section 1 – Demographic Data Section 8 – Sustainability Data	Section 1 – Nominal, Ordinal Section 8 – Ordinal	Associational Analysis Simultaneous Multiple Regression

To further assist in the analysis of these questions the following null hypothesis were employed:

1) There are no associations between the following resources and sustainability in Colorado agricultural education programs (RQ2):
    a) Curriculum Design and Instruction,
    b) FFA and Leadership Development,
    c) SAE and Experiential Learning,
    d) Agriculture Teacher Characteristics,
    e) Program Management, and
    f) Program Support.
2) There are no differences in perceptions of agricultural education sustainability among three stakeholder groups (administrators, teachers, and community members) (RQ3).
3) There are no differences in the perceptions of agricultural education resource effectiveness among three stakeholder groups (administrators, teachers, and community members) (RQ3.1).
4) There are no differences in the perceptions of agricultural education resource importance among three different stakeholder groups (administrators, teachers and community members) (RQ3.2).
5) There is no predictability of sustainability in Colorado Ag Ed from the following demographics (RQ4):
    a) Length of Time Affiliated with Current School,

b) Length of Time in Profession (teacher and administrator only),

c) High School Enrollment,

d) Agricultural Education Enrollment,

e) Perception of Agriculture Industry.

Research Design Rationale

The dominant method for conducting surveys prior to the 1970's was face-to-face interviews. Since that time surveys have moved to telephone, mail and most recently to electronic survey delivery (Dillman, 2000). The ease of conducting personal surveys without contracted professional organizations and the cost and time benefits have expedited the change to mail and web-based surveys (Dillman, 2000; Gliner & Morgan, 2000).

Surveys are often used in agricultural education research to ascertain the perceptions of the stakeholders. Surveys completed by public school administrators have answered questions regarding factors used in hiring first-year Ag Ed teachers (Cantrell & Weeks, 2004), satisfaction with first-year teachers (Weeks & Terry, 2000), perceptions of leadership skills gained by the FFA (Franze, Smith & Kistler, 2004), and attitudes towards agriscience teachers (Hinkson & Keith, 2000).

Additionally, teacher perceptions are often the subject of Ag Ed research. Swortzel (1996) surveyed teachers regarding their planning and supervision strategies of SAE programs; Eaton and Bruening (1996) studied the perceptions of Ag Ed teachers towards a state-level Ag Ed strategic plan, and many studies have focused on the in-service needs of Ag Ed teachers (Joerger, 2002). Additionally, Johnson (1996) surveyed

teachers for their perceived support for getting science credit for Ag Ed courses, while Norris and Briers (1989) designed a survey to gain perceptions of Ag Ed teachers regarding changes made in the agriculture curricula at the secondary level, a study design which heavily influenced the design of this research, Additional survey research was performed by Straquadine (1988) who surveyed teachers regarding factors of Ag Ed program quality.

Other stakeholders' perceptions have been surveyed as well. Students answered studies regarding their attitude of the FFA Organization (Croom, B. & Flowers, 2001); the influence of the FFA on their post-secondary agriculture college leadership activities (Park & Dyer, 2005); and for their perceptions of technology on student association activities (Taylor, 2006). Professionals, business and industry personnel, state-level agriculture leaders have also been surveyed to gain perceptions, attitudes of support, and current issues related to agriculture industry, education and to parameters of total program success in vocational education (Falvey & Matthers, 1999; Stewart, Moore & Flowers, 2004; Vamadore & Iverson, 1991; Wardlow & Joerger, 1996).

The contextual nature of sustainability necessitates that multiple stakeholder's be surveyed. Survey research, while it has limitations, provides these multiple viewpoints in relatively efficient manner. Survey research regarding perceptions has often been used in agricultural education and has been well received (justification that this research may also be received by the profession). This research provides a holistic view of program sustainability which to this point has not been adequately researched in the Ag Ed discipline.

Participants

Three different populations were surveyed for this study on sustainability. The first was a population of the teachers, those employed as the agricultural education instructor for the 2007-2008 school-year, as defined by the Colorado Agricultural Education Directory. The second population was all administrators who have primary responsibility for supervision and administration of the secondary agricultural education programs in Colorado for the 2007-2008 school-year. The third group surveyed was a sample of community members who have knowledge of agricultural education program. Local agriculture teachers were asked to provide names and contact information for the local agricultural education advisory committees to complete the survey for this population, from which two or three individuals were randomly selected to be representative of the population and asked to participate in the study. Generalizability of the study results will be limited as those community members surveyed will have knowledge of Ag Ed, however this represents an accessible population to the researcher.

Instrument

The researcher designed survey contained eight parts, with distinct questions in each section based upon previous research and developed standards and quality indicators (Colorado Community College System, 2003; Dormondy, Seevers, & Clason, 1996; Dormondy & Torres, 2002; Edwards & Briers, 2001; Jewell, 1989; National Council for Agricultural Education, n.d.; National Council for Agricultural Education, 2007; Swortzel, 1996; Thompson, 1986; Weeks & Terry, 2000). A copy of the survey instrument is attached as APPENDIX A.

The first section asked respondents to provide demographic data pertaining to experience, the size of their school, size of Ag Ed program, and regional location. Additional questions asked pertained to the type of community (rural, suburban, urban) and perceptions of the agriculture industry. This was primarily nominal data with the exception of the school and Ag Ed size in which the data presented was actually treated as ordinal data (higher responses indicated larger enrollments) and agriculture industry outlook which was also ordinal data.

The next six parts of the survey asked questions with regard to the characteristics within each of the six program resources of Organization and Instructional Content, FFA and Leadership Development, SAE and Experiential Learning, the Agriculture Teacher, Program Management and Program Support. Respondents reported program characteristics in each of the resources by stating if the characteristic was "Important, and Locally Implemented," "Important but NOT Locally Implemented," "NOT Important but Locally Implemented," or "NOT important and NOT Locally Implemented." The data was coded with 1-4 respectively regarding the answers.

Characteristics regarding resources were selected in several ways. First a literature review was conducted to find like studies using multiple Ag Ed program parameters. Several studies were reviewed (see Burris & Keller, 2007; Dormondy, Seever & Clason, 1996; Duncan, Ricketts, Peake & Uesseler, 2006; Garton & Chung, 1996, Joerger, 2002; Johnson, 1996; Swortzel, 1996; Weeks & Terry, 2000) and indicators from these studies were entered into Microsoft Excel. After literature review was exhausted, several resources were then reviewed that provide guidelines for Ag Ed programs. These

documents included: Standards and Quality Indicators for Colorado Secondary Ag Ed Programs (Colorado Community College System, 2003), Career Cluster Initiative (2007), LifeKnowledge (n.d.); A guide for Local Program Success (National Council for Agricultural Education (n.d.). Guidelines and Expectations for Ohio SAE Programs (n.d.) and the National FFA Handbook (National FFA Organization, 2006). Important indicators and parameters were added to the list in Microsoft Excel. Each Indicator was than coded by the six program resources and sorted. Duplicates were eliminated, and a preliminary list of 377 indicators was developed. The indicators were reviewed by a panel of experts and consolidated into important characteristics for Colorado Ag Ed. After pilot testing and validity confirmation, the list was again revised and narrowed. There were 26 final characteristics for Organization and Instructional Content, 21 characteristics for FFA and Leadership Development, 21 characteristics for SAE and Experiential Learning, 26 characteristics of the Agriculture Teacher, 17 characteristics of Program Management, and 16 characteristics of Program Support entered into the final survey. A copy of the survey is attached as APPENDIX A.

At the end of each resource section, the survey contained one question as to the effectiveness of the resource in the local program. The survey coded a response of 1=Very Effective, 2= Effective, 3= Slightly Effective, 4=Slightly Ineffective, 5=Ineffective and 6=Very Ineffective for all resources except for Program Support. Program support was coded on a five-point scale where 1=Very High (Program Support), 2=High, 3=Adequate, 4=Low and 5=Very Low.

Finally, the last section of the survey asked respondents to report their perceptions of the importance, or essentiality of these resources and their impact to sustainability of the total program of agricultural education. Using a six-point Likert-type scale, participants responded to the statements such as "Organization and Instructional Design is essential to the overall sustainability of the local Ag Ed program." where 1= strongly agree, 2=agree, 3= slightly agree, 4=slightly disagree, 5=disagree, and 6=strongly disagree. An even numbered response, Likert-type scale will be used to compel the respondent to one side of the scale (McMillan, 2004).

Evaluation of Proposed Method

Survey research, especially with a researcher developed questionnaire, is not typically recommended for the novice researcher because of issues with validity and reliability, the lack of existing survey documents require that the questionnaire be developed, however procedures employed will assist the researcher in obtaining valid and reliable data.

Validity.

McMillan (2004) reminds that "locally devised instruments, with little or no history or use or reviews by others, need to be evaluated with more care" (p. 140). To ensure the questionnaire would yield trustworthy data, a panel of individuals with expertise in survey development reviewed the survey for design and question arrangement. Content and face validity was ascertained by a second group of experts (Team Ag Ed) who are familiar with agricultural education programs and resources. Both panels were asked to review all items for clarity and completeness (McMillan, 2004)

thereby strengthening the validity of the survey. Finally, the survey was pilot tested with seven students in a pre-service agricultural education program. These individuals determined the precision of the administration procedures and the overall ease of taking the survey. Several suggestions for improvement in the survey were implemented following the panel reviews and the initial pilot test. The survey was pilot tested a second time with the same group of individuals. Feedback and changes were again implemented before final test administration.

Reliability.

Reliability analysis allows you to study the properties of measurement scales and the items that compose the scales. For this study, then, reliability will measure each scale (each scaled item compared to another) and the items that make up the scales, the resource characteristics, for example. To assess internal consistency of the instrument, a Cronhach Alpha statistic was employed. This model is one of internal consistency, based on the average inter-item response and will determine the consistency of measuring a single construct (Gliner & Morgan, 2000). Reliability must be established on each portion of the survey (except for the personal demographic information) and for the overall document (Norris & Briers, 1989). Results of the reliability estimate can be found in Chapter 4.

Finally, thorough research design must consider if the proposed research questions can be answered through this study. The developed survey closely followed the intent of the research questions, and the survey was specifically built around the

framework of this study. The survey and data collection provided information that was useful and appropriate to answer the research questions.

Procedures

The following procedures were employed to collect data; however steps preceding the delivery of the surveys assured the researcher and the participants that all ethical concerns regarding the collection of this information are met. This study and accompanying survey were first given to the Internal Review Board (IRB) Human Research Committee (HRC) at Colorado State University in order to assure that all confidentiality and anonymity issues were appropriately addressed regarding the rights of human subject participants. To this end, the research and data collection occurred only after approval by this governing body. A copy of the approval document is attached as APPENDIX B.

Teacher Survey

Three different surveys were utilized to ascertain the perceptions of sustainability for Colorado's Ag Ed programs. The first survey was an electronic survey for secondary teachers in Colorado Ag Ed programs for the 2007-2008 school year, as identified by the Colorado Agricultural Education Directory (n=114). The data was collected through an internet survey provider, Survey Monkey. The surveys were delivered to the entire population of individuals who meet the qualifications of the teacher group. In order to prevent non-response error, several techniques were employed following a modified use of Dillmans' Tailored Design method (Dillman, 2000). First an electronic pre-notice letter was sent through the email distribution listserv coordinated through Colorado

Community College System. One week later, the link to the electronic survey was sent to all agriculture teachers via the same listserv distribution, and the link was posted to the Ag Ed curriculum and Colorado FFA Websites. The electronic cover letter was distributed as the first page of the electronic survey. A copy of the electronic survey and cover letter is attached as APPENDIX A. Reminders were included in the Weekly Ag Ed Updates which was sent out by the administrative personnel in Ag Ed each week. Specific email reminders were also sent once a week, encouraging teachers to take the survey if they had not already done so. Examples of the pre-notice, cover letter, and reminder notices are found in APPENDIX C.

Administrator Survey

The second survey was also an electronic survey delivered to the primary administrators (superintendents, principals or CTE administrators) of secondary Ag Ed programs (n=94 due to multiple teacher departments). Due to the varying sizes of districts and personnel in charge of the CTE programs, the secondary teachers were asked to confirm the name and contact information of the primary administrator in each school district. If electronic information was unavailable for administrators, then mailed instruments were sent, and the procedures followed that outlined for the community group mailed surveys. The administrator survey was identical in form to that of the agricultural education teacher.

Procedures employed to insure appropriate response rate included: pre-notice letter, cover letter with survey, follow up email reminder, second follow up email reminder and final post card reminder (mailed).

Community Survey

A third survey was sent to a sample of community members from a list supplied by local agriculture teacher. The agriculture teachers were asked to submit names and contact information for their advisory committees, a copy of this recruitment letter is attached as APPENDIX D; 74 teachers responded. Then a random sample of two to three individuals was selected from each of the lists (n=156). A random selection was utilized to eliminate coverage errors that may be inherent in poor survey sampling. A pre-notice letter (APPENDIX C) was sent to all participants explaining the study and the upcoming survey. A survey and cover letter was then sent to all members of the community group one week after the pre-notice letter was sent. At this time, the electronic link was also sent for those that wished to take the survey in an electronic format. A thank you follow up postcard was then sent to the group, according to suggestions offered by Dillman (2000) to obtain the highest response rates. While the survey was in a paper format, the essence of the survey was identical to the teacher and the administrator survey.

In a few cases, the contact information for the advisory committee letter was actually emails. In these instances, the procedures were the same as those for the electronic survey for the teachers and administrators: pre-notice, survey link with cover letter, first follow up, and second follow up reminder. In the cases where both email and mailed contacts were obtained, a mailed post-card reminder was also sent. Otherwise, the second reminder was the final contact with the community group.

While the process of delivering the surveys in two separate methods may seem cumbersome, there were questions as to the reliability and access to internet for

community members in the largely isolated and rural areas of Colorado. Alternatively, most schools communicate over the web and have more reliable internet services. When the sample participants are all internet savvy, "such as teachers, principals, and college faculties and staff, and the nature of the topic is not personal, then electronic surveys are excellent for conducting research" (McMillan, 2004, p. 199). Therefore, the best method of data collection for this study was two separate but similar methods.

Data Analysis and Form of Results

This research design collected an extensive amount of data. Several steps preceded the data analysis. Mailed survey data was first entered into Survey Monkey through the manual entry function. Once the survey was closed and no further responses added, the data was downloaded into Microsoft Excel. Data was given an exploratory look. Headings were added to the Excel spreadsheets and columns were collapsed (i.e. the resource characteristics took up four columns, one for each response, when truly it needed to be only one column). Once columns were collapsed, each characteristic was double checked to insure that information had collapsed correctly. The data was then merged as one sheet into Statistical Package for the Social Sciences (SPSS), where the data was coded. Once merged, data was double checked with mailed surveys to insure accuracy of data merge. Variables were labeled and value labels were added to signify the meaning of the numbers. Data was essentially in two different scales of measurement: nominal data, and ordinal ranked data. Open-ended response items were not coded in any way in SPSS, and are viewed at the bottom of the code book as nominal data, even though this data was not used in any statistical fashion. The following paragraphs

summarize the data collected in each of the sections of the survey. A copy of the survey can be found in APPPENDIX A.

Section I of the survey is titled "General Information" and is the demographic data for each respondent. This information is nominal in scale, meaning that the categories or groups are merely descriptive names, and are thus not ordered (Gliner & Morgan, 2000). The exception to this are the ordinal scales of the school and Ag Ed program size, and ordinal scale of the responses to the question: "In the next five years, the future of agriculture in the local area will be" and where the responses were Very Positive=1, Positive=2, Negative=3 and Very Negative=4.

Section II through section VII of the survey all pertain to the six resources of Ag Ed. These sections had from 16-26 characteristics of the resources listed and ask if these characteristics are "Important and Locally Implemented"=1, "Important but NOT Locally Implemented" =2, "NOT Important but Locally Implemented" =3, or "NOT Important and NOT Locally Implemented" =4. Responses are all coded as nominal data. Following the characteristics, there was an additional question that asks the "Effectiveness" of the resources the local program. This question for Organization and Instructional Content, FFA and Leadership Development, SAE and Experiential Learning, the Agriculture Teacher and Program Management resources are coded on a six-point scale, where Very Effective=1, Effective = 2, Slightly Effective = 3, Slightly Ineffective = 4, Ineffective = 4 and Very Ineffective = 6. The Program Support question is actually coded on a five-point scale where support rated Very High = 1, High = 2, Adequate = 3, Low = 4 and Very Low = 5.

Section VIII is on sustainability. All questions here had Likert-type responses. The Likert-type questions were considered to be ordinal data, where three or more ordered categories or levels of data are collected, but the levels are unequal and yet are ranked (Gliner & Morgan, 2000). In the current section, survey questions utilizing the Likert-type data score from 1 (Strongly Agree) to 6 (Strongly Disagree). These questions asked for responses to questions like: Organization and Instructional Design is essential to the overall sustainability of the local Ag Ed Program. This is asked on all six Ag Ed resources.

The next four questions in Section VIII asked for responses to the four parameters of sustainability: longevity, livability, adaptability and supportability. These survey questions utilized a six-point Likert-type scale where 1 = Strongly Agree to 6 =Strongly Disagree.

Finally the last question in this section ranked the sustainability of the local Ag Ed program. Again, it was a scale from 1 (Very Sustainable) to 10 (Very Unsustainable). Finally, two open-ended questions were asked regarding what could strengthen and threaten Ag Ed sustainability in the future. These responses were used to verify findings and provide explanations to the statistical findings of the study.

Data was first given an exploratory look to determine if it was usable data for analysis purposes. Scatter plots, box plots and descriptive statistics found outliers in the data. The research then went back to the data to determine if the data was in error or if the data was truly an outlier that needed to be included or excluded from the study. If two

answers were given in any one question, the lowest response was selected and recoded for that answer. This was especially helpful for the responses that were between answers or had multiple answers in the resource characterization section. It made the most sense in the data that if the choice was between "Important and Implemented" and "Important but NOT Implemented" that the second one should be the true selection. There were 20 items on the original data that required verification or re-coding. All data was then included in the study.

Many questions were not answered in this study. The researcher made the choice to include all respondents' data, even those that had left a significant portion of the survey blank. The detailed sections of the survey may have been the reason for the limited responses in some cases; and this too held meaning for the researcher. The numbers of non-responses are presented in Chapter 4 tables.

After the exploratory analysis and determination of recoding or inclusion of responses in the study, descriptive statistics were employed to analyze the data (means, standard deviations). Regarding all nominal scaled responses, the frequency distributions and modes were calculated; as the mean and variance are somewhat meaningless to nominal data (Gliner & Morgan, 2000). Regarding all Likert-type responses, frequencies and measures of central tendency were calculated. Due the nature of the Likert-type scale, the data was, as expected, non-parametric in nature. Therefore non-parametric tests were utilized for further data analysis.

The first step in the actual data analysis was to calculate the reliability of the survey instrument using Cronbach Alpha statistic. Second step was to run frequency

counts and descriptive statistics on all of the resource characteristics. Third, associations were done to determine the relationship of resources on sustainability. Next, group comparisons were run on sustainability data and on effectiveness and essentiality data by use of Kruskal-Wallis non-parametric tests with Mann-Whitney post hoc tests. Finally, a multiple regression analysis was performed utilizing ordinal demographic data to sustainability to determine if the demographics were significant predictors of sustainability. Findings are presented in Chapter four.

CHAPTER 4: FINDINGS

The purpose of the study was four-fold: first to understand if Colorado Ag Ed programs are sustainable; second, to determine the characteristics of important resources in agricultural education, namely Organization and Instructional Design, FFA, SAE, the Ag Teacher, Program Management and Program Support; third, to determine the impact of these resources on program sustainability; and finally, to understand the demographics that might impact sustainability. Knowledge of sustainability may help policy makers to develop models for program growth consistent with the state and national strategic plans for growth of Ag Ed programs.

The research questions that guided the study were:

1) What characterizes the following resources for agricultural education programs in Colorado?
    a) Organization and Instructional Content
    b) FFA and Leadership Development
    c) SAE and Experiential Learning
    d) Agricultural Teacher Characteristics
    e) Program Management
    f) Program Support
2) What is the association between the following resources and sustainability in Colorado agricultural education programs?
    a) Organization and Instructional Content
    b) FFA and Leadership Development

c) SAE and Experiential Learning

d) Agricultural Teacher Characteristics

e) Program Management

f) Program Support

3) Are the perceptions of agricultural education sustainability different between administrators, teachers, and community members?

3.1) Are the perceptions of resource effectiveness different between administrators, teachers and community members?

3.2) Are the perceptions of the essentiality of resources different between administrators, teachers and community members?

4) What is the association between the following identifying demographics and sustainability in Colorado agricultural education programs?

a) Length of Time Affiliated with Current School

b) Length of Time in Profession (Teacher and Administrator only)

c) Rural and Non-rural School Districts

d) High School Enrollment

e) Agricultural Education Enrollment

f) FFA District

g) Perception of the Agriculture Industry

To further assist in the analysis of these questions the following null hypothesis were employed:

1) There are no associations between the following resources and sustainability in Colorado agricultural education programs (RQ2):
    a) Organization and Instructional Content,
    a) FFA and Leadership Development,
    b) SAE and Experiential Learning,
    c) Agriculture Teacher Characteristics,
    d) Program Management, and
    e) Program Support.
2) There are no differences in perceptions of agricultural education sustainability among three stakeholder groups (administrators, teachers, and community members) (RQ3).
3) There are no differences in the perceptions of agricultural education resource effectiveness among three stakeholder groups (administrators, teachers, and community members) (RQ3.1).
4) There are no differences in the perceptions of agricultural education resource importance among three different stakeholder groups (administrators, teachers and community members) (RQ3.2).
5) There are no associations between the following demographics and sustainability in Colorado agricultural education programs (RQ4):
    a) Length of Time Affiliated with Current School,
    b) Length of Time in Profession (teacher and administrator only),
    c) High School Enrollment,

d) Agricultural Education Enrollment,

e) Perception of Agriculture Industry.

A researcher developed survey was employed for the data collection. Three stakeholders groups participated in the survey: administrators, teachers and community members of local agricultural education programs in Colorado.

This chapter reports the findings of this study, response rate and survey reliability data, and then findings outlined by research question. Data were summarized and displayed in both narrative and tabular formats, displayed as frequency tables, summary statistics, and Chi square statistics, and correlations.

Response Rate

Administrators are defined as those individuals who have the primary responsibility for local agricultural education program administration. They were identified through the Colorado Agricultural Education Directory (2007) and verified through communication with the local agriculture teachers. The survey was electronically distributed to 100 administrators, representing the population of agricultural education program administrators. One principal responded that their school no longer had an active agricultural education program, reducing the population to 99 individuals. Surveys were completed by 64 individuals, representing a response rate of 64.6 percent (Figure 4.1).

Teachers were identified through the Colorado Agricultural Education Directory. The survey was electronically distributed to 114 secondary teachers, of which 96 completed the survey. This represented a response rate of 82.5 percent.

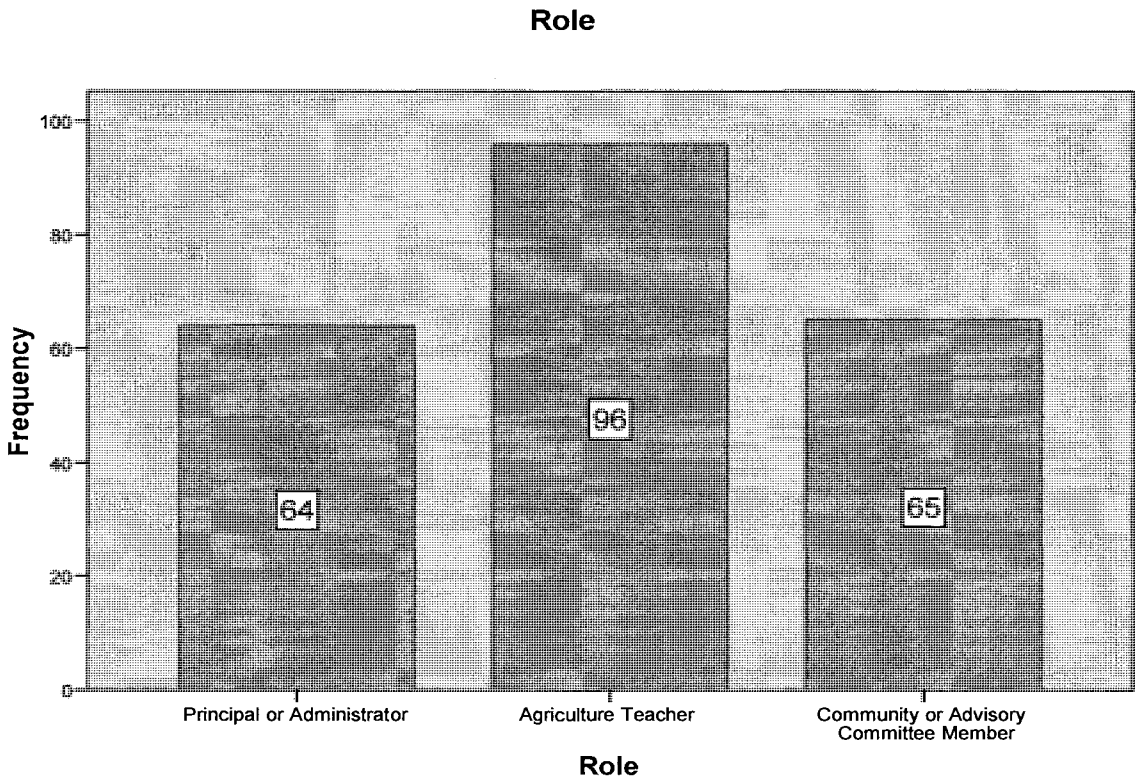

Figure 4.1. Frequency counts of respondents by stakeholder group

Finally, agriculture teachers were asked to submit names and contact information for the local agricultural education advisory committees (or, if an active agricultural education advisory committee was not available, teachers were asked to submit names of local community members familiar with the local program). Seventy-four teachers (64.9 percent) responded with contact information for community members. From these lists, 158 individuals were randomly selected to participate in the survey. Two notices were returned with expired addresses, reducing the sample to 156 individuals. This represented a response rate of 41.7 percent (65 respondents).

Respondents

The typical respondent to the survey, determined by the plurality of responses (for all three groups combined), had been affiliated with the school for 2-4 years (22.7 percent). The school district was typically in a rural area (83.6 percent), had a high school enrollment of 101-300 students (27.8 percent), and had an agricultural education program enrollment of 16-30 students (25.0 percent). Additionally the typical respondent was positive about the five-year future of agriculture in the local area (68.6 percent), agreed that there were viable opportunities for employment in agriculture in the next five years (89.7 percent) and agreed that the agriculture industry provided economic stability to the local economy (93.7 percent).

Reliability

To adequately test the reliability of the survey instrument, Cronbach's alpha statistic was utilized on each section of the instrument that had like scales. Table 4.1 reports the internal consistency of the survey. "Alpha should be positive and usually greater than .70 in order to provide good support for internal consistency reliability" (Morgan, Leech, Gloecker & Barrett, 2007, p. 129). Overall the survey document had marginal to good internal consistency. On items where the Alpha level was below the .70 threshold, the standardized alpha level was above .70 (indicating that the means and standard deviations were different, and this is taken into account in the standardized measure). It is important to note that there were five different scales of measurement in this survey, and to correctly run Cronbach's alpha on the entire document, the

Table 4.1

Cronbach's Alpha Measure of Internal Consistency of Sustainability Survey

Section of Survey	N of Items	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items
Organization and Instructional Design	26	.629	.733
FFA and Leadership Development	21	.942	.954
SAE and Experiential Learning	21	.854	.882
Agriculture Teacher	26	.691	.809
Program Management	17	.709	.754
Program Support	16	.664	.714
Composite for all Likert-type Items With Six-Point Scale (Effectiveness and Essentiality Measures)	11	.846	.857
Composite for all Resources	127	.905	.926

scales needed to be consistent. In order to run the alpha levels over the entire document, the scales would need to be consistent throughout the survey.

Characterizing Resources

The first step to data analysis was to characterize the resources found in agricultural education as identified by the three stakeholder groups collectively. As a

local control state where Career and Technical Education is not under the auspices of the Department of Education, policies and programmatic characteristics may vary from program to program. Therefore, frequencies tables for each of the six resource characteristics were created. Data utilized was collected on Sections II through VII of the survey. Participants were asked to rank the resource statements as "Important and Locally Implemented," "Important but Not Locally Implemented," "Not Important but Implemented," or "Not Important, Not Implemented." Each resource statement was considered to characterize a program only if the highest frequency response was "Important and Locally Implemented" and if the frequency of response was higher than a 50 percent (a majority of responses).

Research question one asked for the characteristics of each of the agricultural education program characteristics. Data was very positively skewed, indicating that there was not a normal distribution of responses, typical of nominal, perception data. The data shows that the majority of the responses for each of the resource characteristics was "Important and Implemented."

Characterizing Organization and Instructional Content

The Organization and Instructional Content resource include items relating to the structure of the courses offered, the content delivered in courses and methods utilized to deliver agriculture content. Summary frequency responses (counts) and percent responses (%) are reported for all groups collectively in Table 4.2.

Table 4.2

Characteristics of Organization and Instructional Content in Ag Ed in Colorado

Frequency Counts and Percentage of Responses

Organization and Instructional Content Statements	Impt and Implmnt **Count/%**	Impt But NOT Implmnt **Count/%**	NOT Impt But Implmnt **Count/%**	NOT Impt and NOT Implmnt **Count/%**	Number and Percent Respndnts Missing **Count/%**
Ag Ed notebooks are utilized*	172/76.4%	21/9.3%	11/4.9%	7/3.1%	14/6.2%
Ag Ed courses are in Ag I/Ag II/Ag III/IV format	103/45.8%	33/14.7%	16/7.1%	53/23.6%	20/8.9%
Ag Ed courses are aligned along career pathways (such as Animal Science or Agribusiness)*	152/67.6%	43/19.1%	1/0.4%	13/5.8%	16/7.1%
Ag Ed is offered in both formats (Ag I/Ag II & pathways)*	122/54.2%	43/19.1%	8/3.6%	29/12.9%	23/10.2%
Leadership development (FFA) is integral to instructional delivery and is taught in the classroom*	200/88.9%	11/4.9%	4/1.8%	0/0.0%	10/4.4%
Students have an agriculture occupational objective (plan to be employed in agriculture)*	134/59.6%	57/25.3%	12/5.3%	8/3.6%	14/6.2%
Program design and content are based upon input from stakeholders (students, parents, advisory committee)*	189/84.0%	20/8.9%	3/1.3%	0/0.0%	13/5.8%
The program offers courses for college credit**	56/24.9%	111/49.3 %	11/4.9%	30/13.3%	17/7.6%

Table 4.2

Characteristics of Organization and Instructional Content in Ag Ed in Colorado

Frequency Counts and Percentage of Responses (continued)

Organization and Instructional Content Statements	Impt and Implmnt **Count/%**	Impt But NOT Implmnt **Count/%**	NOT Impt But Implmnt **Count/ %**	NOT Impt and NOT Implmnt **Count/ %**	Number and Percent Respndnts Missing **Count/%**
Lesson plans are utilized and match approved course of study*	199/88.4%	12/5.3%	0/0.0%	1/0.4%	13/5.8%
Course content includes Agribusiness*	201/89.3%	11/4.9%	2/0.9%	0/0.0%	11/4.9%
Course content includes Environmental Sciences*	145/64.4%	49/21.8%	6/2.7%	7/3.1%	18/8.0%
Course content includes Animal Science*	199/88.4%	7/3.1%	2/0.9%	3/1.3%	14/6.2%
Course content includes Plant Science*	194/86.2%	16/7.1%	0/0.0%	1/0.4%	14/6.2%
Course content includes Natural Resources*	150/66.7%	53/23.6%	3/1.3%	5/2.2%	14/6.2%
Course content is delivered in Power, Structure and Technical systems (mechanics)*	164/72.9%	28/12.4%	7/3.1%	7/3.1%	1/0.4%
Course content is delivered in Food Science and Products**	88/39.1%	92/40.9%	7/3.1%	21/9.3%	17/7.6%
Students of all ability levels are enrolled in the program*	199/88.4%	8/3.6%	1/0.4%	1/0.4%	16/7.1%
Students with disabilities take courses in Ag Ed*	186/82.7%	13/5.8%	3/1.3%	3/1.3%	20/8.9%

Table 4.2

Characteristics of Organization and Instructional Content in Ag Ed in Colorado

Frequency Counts and Percentage of Responses (continued)

Organization and Instructional Content Statements	Impt and Implmnt **Count/%**	Impt But NOT Implmnt **Count/%**	NOT Impt But Implmnt **Count/%**	NOT Impt and NOT Implmnt **Count/%**	Number and Percent Respndnts Missing **Count/%**
Ag Ed courses receive academic credit (i.e. In science, math or speech) *	130/57.8%	64/28.4%	3/1.3%	12/5.3%	16/7.1%
The program reinforces important academic concepts*	201/89.3%	9/4.0%	0/0.0%	1/0.4%	14/6.2%
A school farm is available for instruction**	48/21.3%	113/50.2%	5/2.2%	42/18.7%	17/7.6%
A greenhouse is available for instruction	100/44.4%	83/36.9%	3/1.3%	26/11.6%	13/5.8%
A shop or mechanics facility is available for instruction*	188/83.6%	16/7.1%	5/2.2%	4/1.8%	12/5.3%
Program is based on student interest*	172/76.4%	28/12.4%	6/2.7%	1/0.4%	18/8.0%
Instructional content is delivered in problem-based format (problems and solutions)*	166/73.8%	24/10.7%	8/3.6%	10/4.4%	17/7.6%
Engagement activities (or E-moments) are utilized and integrated into instruction*	141/62.7%	48/21.3%	5/2.2%	3/1.3%	28/12.4%

* Characteristics identified as receiving over 50% of responses and having highest responses in "Important and Implemented." These characterize Ag Ed resources in Colorado. Shaded items have over 75% plurality of responses in "Important and Implemented."

** Identified as characteristics with highest frequency counts of "Important but NOT Implemented."

In the Organization and Instructional Content resource, 21 of 26 statements were considered to be representative of Colorado agricultural education programs (because they had the highest response as "Important and Implemented"). The top responses for the Organization and Instructional Content included: Course includes Agribusiness (89.3%), Leadership development (FFA) is integral to instructional delivery and is taught in the classroom (88.9%), Lesson Plans are utilized and match an approved course of study (88.4%), Students of all ability levels are enrolled in the program (88.4%), and Course content includes animal science (88.4%). There are 16 additional statements that are also characteristic of Colorado Ag Ed programs, as represented by single asterisks on Table 4.2. To further characterize the responses, the shaded items on Table 4.2 represent responses receiving at least a 75 percent plurality in "Important and Implemented." According to plurality response, on the scale of very effective to very ineffective, the resource of Organization and Instructional Content was characterized as "Effective;" chosen by 121 or 53.8% of respondents ($M = 1.86$, $SD = .684$).

Five statements within the Organization and Instructional Content resource list are not representative of Colorado Ag Ed programs as the data did not indicate that at least 50% of the respondents deemed this to be "Important and Implemented" or the highest response was in another category. These included: School Farm is available for instruction, Program offers courses for college credit, Course content is delivered in Food Science and Products, A greenhouse is available for instruction, and Ag Ed Courses are offered in Ag I/Ag II/AgIII/IV format (Table 4.2). Three of these characteristics were

deemed "Important but NOT Implemented" according to their highest responses, indicating that these may be growth areas for Ag Ed in the future.

Characterizing FFA and Leadership Development

Section III of the survey collected data regarding FFA and Leadership Development. The characteristics included in this portion of the survey pertained to the activities and operating procedures for local FFA Chapters. A summary of all responses in this section can be found in Table 4.3.

The local FFA was the second program resource considered in determining the characteristics of Ag Ed programs in Colorado. All statements in the FFA and Leadership Development resource were deemed "Important and Implemented" by the respondents. The lowest response of "Importance and Implemented" was 62.6 percent of responses, indicating that all characteristics are representative of Ag Ed programs in Colorado. The characteristics receiving the highest frequencies of responses were: There is a local FFA chapter (92.0%), chapter annually participates in State/National activities (89.3%), FFA Chapter conducts community service activities (88.0%), chapter elects and trains a capable officer team (87.6%), and there is a local FFA banquet (87.1%).

Table 4.3

Characteristics of FFA and Leadership Development in Colorado Ag Ed Programs

Frequency Counts and Percentage of Responses

FFA and Leadership Development Statements	Impt and Implmnt **Count/%**	Impt But NOT Implmnt **Count/%**	NOT Impt But Implmnt **Count/%**	NOT Impt and NOT Implmnt **Count/%**	Number and Percent Respndnts Missing **Count/%**
There is a local FFA Chapter*	207/92.0%	4/1.8%	2/0.9%	0/0.0%	12/5.3%
All students in Ag Ed are FFA members*	141/62.7%	31/22.7%	6/2.7%	11/4.9%	16/7.1%
The chapter annually participates in State/National FFA activities*	201/89.3%	8/3.6%	1/0.4%	2/0.9%	13/5.8%
The local chapter participates in the National Chapter Awards program (completes the application) each year*	149/66.2%	49/21.8%	6/2.7%	7/3.1%	14/6.2%
Chapter conducts 10 local activities (or more) each year*	180/80.0%	19/8.4%	1/0.4%	5/2.2%	20/8.9%
The chapter conducts fun, well-planned, regularly scheduled meetings*	186/82.7%	19/8.4%	1/0.4%	4/1.8%	15/6.7%

Table 4.3

Characteristics of FFA and Leadership Development in Colorado Ag Ed Programs

Frequency Counts and Percentage of Responses (continued)

FFA and Leadership Development Statements	Impt and Implmnt **Count/%**	Impt But NOT Implmnt **Count/%**	NOT Impt But Implmnt **Count/%**	NOT Impt and NOT Implmnt **Count/%**	Number and Percent Respndnts Missing **Count/%**
The chapter develops a challenging program of activities*	174/77.3%	27/12.0%	1/0.4%	5/2.2%	18/8.0%
Members complete proficiency applications*	160/71.1%	37/16.4%	3/1.3%	6/2.7%	19/8.4%
FFA membership reflects the diversity of the school enrollment*	161/71.6%	39/17.3%	8.0/3.6%	2/0.9%	15/6.7%
The chapter has ample fund-raising activities*	186/82.7%	21/9.3%	0/0.0%	0/0.0%	18/8.0%
There is a local FFA banquet*	196/87.1%	12/5.3%	0/0/0%	2/0.9%	15/6.7%
Students are prepared for Career Development Events (also called judging contests)*	195/86.7%	13/5.8%	0/0.0%	3/1.3%	14/6.2%
The chapter elects and trains a capable officer team*	197/87.6%	10/4.4%	0/0.0%	3/1.3%	15/6.7%

Table 4.3

Characteristics of FFA and Leadership Development in Colorado Ag Ed Programs

Frequency Counts and Percentage of Responses (continued)

FFA and Leadership Development Statements	Impt and Implmnt **Count/%**	Impt But NOT Implmnt **Count/%**	NOT Impt But Implmnt **Count/%**	NOT Impt and NOT Implmnt **Count/%**	Number and Percent Respndnts Missing **Count/%**
The FFA participates in chapter traditions*	187/83.1%	15/6.7%	0/0.0%	5/2.2%	18/8.0%
The FFA Chapter conducts community service activities*	198/88.0%	13/5.8%	0/0.0%	2/0.9%	12/5.3%
The FFA uses a workable constitution and bylaws*	185/82.2%	21/9.3%	0/0.0%	4/1.8%	15/6.7%
FFA members apply and receive the Greenhand FFA Degree*	192/85.3%	13/5.8%	0/0.0%	4/1.8%	15/6.7%
FFA members apply and receive the Chapter FFA Degree*	189/84.0%	16/7.1%	0/0.0%	4/1.8%	16/7.1%
FFA members apply and receive the State FFA Degree*	178/79.1%	24/10.7%	1/0.4%	4/1.8%	18/8.0%

Table 4.3

Characteristics of FFA and Leadership Development in Colorado Ag Ed Programs

Frequency Counts and Percentage of Responses (continued)

FFA and Leadership Development Statements	Impt and Implmnt **Count/%**	Impt But NOT Implmnt **Count/%**	NOT Impt But Implmnt **Count/%**	NOT Impt and NOT Implmnt **Count/%**	Number and Percent Respndnts Missing **Count/%**
FFA members apply and receive the American FFA Degree*	154/68.4%	45/20.0%	20.9%	4/1.8%	10/8.9%
Members apply for award applications (proficiency, star awards, entrepreneurship, agriscience, etc.)*	171/76.0%	31/13.8%	1/0.4%	4/1.8%	18/8.0%

* Characteristics identified as receiving over 50% of responses and having highest responses in "Important and Implemented." These characterize Ag Ed resources in Colorado.
Shaded items have over 75% plurality of responses in "Important and Implemented."
** Identified as characteristics with highest frequency counts of "Important but NOT Implemented."

All items in the survey characterize FFA and Leadership Development in Colorado, being further refined by those items on Table 4.3 that are shaded, being representative of 75 percent of all respondents (16 of 21 items). Further, on the scale of very effective to very ineffective, the FFA resource is characterized as "Very Effective;" chosen by 109 or 48.4% of respondents ($M = 1.60$, $SD = .776$).

Characterizing SAE and Experiential Learning

Survey statements regarding SAE and Experiential Learning pertained to the level of implementation and management and supervision of student programs. All statements can be found in Section IV of the survey (APPENDIX A). Nineteen of 21 statements were found to characterize Colorado Ag Ed Programs by receiving the highest frequency counts in "Important and Implemented" or by receiving over 50% of responses in "Important and Implemented" (Table 4.4).

The top responses for SAE and Experiential Learning in "Important and Implemented" include: SAE and work-based learning are integrated into the curriculum (84.0%), Students manage their own SAEs (80.9%), Class time is utilized to plan, coordinate and update records related to SAE (77.8%), SAEs are diverse (76.9%) and Students have up to date records of their SAE (76%). Only five of the characteristics had a 75% response in "Important and Implemented;" a smaller number than other resources (indicated by the shaded areas in table 4.4). On the scale of very effective to very ineffective, the SAE component had the highest frequency count as "Effective;" chosen by 102 or 45.3% of respondents ($M = 2.03$, $SD = .909$).

According to respondents, SAE and Experiential learning had two characteristics listed that are not reflective of Colorado Ag Ed programs, including; the instructor conducts three visits to the students SAE yearly and Students in Ag Ed are visited before the first school year. With 34.2 and 40.1 percent of respondents respectively, a majority of the respondents did not select these characteristics as "Important and Implemented,"

although both of these characteristics were considered "Important" according to their frequency counts.

Table 4.4

Characteristics of SAE and Experiential Learning in Colorado Ag Ed Programs

Frequency Counts and Percentage of Responses

SAE and Experiential Learning Statements	Important and locally implemented **Count/%**	Important but NOT locally implemented **Count/%**	NOT Important but locally implemented **Count/%**	NOT important and NOT locally implemented **Count/%**	Number and Percent Respondents Missing **Count/%**
Adequate evidence of SAE visits are maintained*	153/68.0%	50/22.2%	0/0.0%	1/0.4%	21/9.3%
All students conduct viable and meaningful SAE programs*	148/65.8%	54/24.0%	1/0.4%	2/0.9%	20/8.9%
The instructor conducts one visit to students SAE yearly *	163/72.4%	29/12.9%	3/1.3%	0/0.0%	30/13.3%
The instructor conducts three visits to students SAE yearly **	77/34.2%	98/43.6%	5/2.2%	17/7.6%	28/12.4%
Class time is utilized to plan, coordinate, and update records related to the SAE*	175/77.8%	19/8.4%	2/0.9%	3/1.3%	26/11.6%

Table 4.4

Characteristics of SAE and Experiential Learning in Colorado Ag Ed Programs

Frequency Counts and Percentage of Responses (continued)

SAE and Experiential Learning Statements	Important and locally implemented **Count/%**	Important but NOT locally implemented **Count/%**	NOT Important but locally implemented **Count/%**	NOT important and NOT locally implemented **Count/%**	Number and Percent Respondents Missing **Count/%**
SAE and work-based learning are integrated into the curriculum*	189/84.0%	14/6.2%	1/0.4%	2/0.9%	19/8.4%
Students manage their own SAE*	182/80.9%	18/8.0%	1/0.4%	0/0.0%	24/10.7%
SAEs are linked to the curriculum and careers*	169/75.1%	30/13.3%	2/0.9%	1/0.4%	23/10.2%
Parents assist with SAEs*	163/72.4%	27/12.0%	7/3.1%	5/2.5%	23/10.2%
Students are recognized for their SAEs through local awards programs*	160/71.1%	35/15.6%	1/0.4%	2/0.9%	27/12/0%
SAEs are diverse (provide a variety of experiences for students)*	173/76.9%	25/11.1%	2/0.9%	2/0.9%	23/10.2%

Table 4.4

Characteristics of SAE and Experiential Learning in Colorado Ag Ed Programs

Frequency Counts and Percentage of Respondents (continued)

SAE and Experiential Learning Statements	Important and locally implemented **Count/%**	Important but NOT locally implemented **Count/%**	NOT Important but locally implemented **Count/%**	NOT important and NOT locally implemented **Count/%**	Number and Percent Respondents Missing **Count/%**
School facilities are provided to meet the needs of students SAEs*	120/53.3%	63/28.0%	5/2.2%	14/6.2%	23/10.2%
Students enrolling in Ag Ed are visited before the first school year	92/40.9%	79/35.1%	3/1.3%	22/9.8%	29/12.9%
Students have up to date records of their SAE*	171/76.0%	29/12.9%	1/0.4%	3/1.3%	21/9.3%
Students have a Long-Time Plan that allows for SAE expansion and further development*	139/61.8%	55/24.4%	2/0.9%	5/2.2%	24/10.7%
Teacher provides adequate supervision for SAEs*	168/74.7%	32/14.2%	2/0.9%	2/0.9%	21/9.3%

Table 4.4

Characteristics of SAE and Experiential Learning in Colorado Ag Ed Programs

Frequency Counts and Percentage of Respondents (continued)

SAE and Experiential Learning Statements	Important and locally implemented **Count/%**	Important but NOT locally implemented **Count/%**	NOT Important but locally implemented **Count/%**	NOT important and NOT locally implemented **Count/%**	Number and Percent Respondents Missing **Count/%**
The students maintain records using a computer application*	158/70.2%	39/17.3%	2/0.9%	4/1.8%	22/9.8%
The students SAEs are related to an agriculture pathway (i.e. animal systems, ag mechanical or technical systems, food systems)*	167/74.2%	29/12.9%	2/0.9%	5/2.2%	22/9,8%
Student SAEs last over a period of 6 months*	165/73.3%	30/13.3%	1/0.4%	3/1.3%	26/11.6%
Student SAEs extend over 360 hours yearly*	147/65.3%	41/18.2%	4/1.8%	5/2.2%	28/12.4%

* Characteristics identified as receiving over 50% of responses and having highest responses in "Important and Implemented." These characterize Ag Ed resources in Colorado.
Shaded items have over 75% plurality of responses in "Important and Implemented."
** Identified as characteristics with highest frequency counts of "Important but NOT Implemented."

Characterizing Agriculture Teachers

Agriculture Teachers were characterized next in the survey. Data was collected in Section V of the survey, and characteristics pertained to the teaching practices, personal characteristics including degree related questions and professional associations as well as the relationships of the teacher to other staff, administration, parents and students. All characteristics had over a majority of responses in "Important and Implemented" portion of the survey, and would therefore be considered to be characteristic of Colorado Ag Ed Programs (Table 4.5). The highest frequency responses were found on the following characteristics: the teacher has a vocational credential in agriculture (88.9%), develops strong relationships with school faculty, parents, agribusiness leaders, community leaders, etc. (87.1%), advocates for needs and cares for students (86.7%), dedicates individual time to students (86.2%) and provides assistance to school personnel, other teachers, and community members (85.8%). The overall rating of agriculture teachers was "very effective" by 49.8% of plurality of survey respondents (M = 1.55, SD = .703). The least frequent responses were reported for characteristics: Continues training for an advanced degree, with 52.0% of responses in "Important and Implemented" and Instructor lives in the school community, which had a 70.7 % of responses as "Important and Implemented." These characteristics are still representative of Colorado Ag Ed programs obtaining over a majority response in "Important and Implemented," but they were the only characteristics that had less than the 75% of responses, as indicated by the shaded areas in Table 4.5.

Table 4.5

Characteristics of Agriculture Teachers in Colorado Ag Ed Programs

Frequency Counts and Percentage of Responses

Statements Relating to Characteristics of Agriculture Teachers	Important and locally implemented **Count/%**	Important but NOT locally implemented **Count/%**	NOT Important but locally implemented **Count/%**	NOT important and NOT locally implemented **Count/%**	Number and Percent Respondents Missing **Count/%**
Advocates for needs and cares for students*	195/86.7%	12/5.3%	0/0.0%	0/0.0%	18/8.0%
Assesses and evaluates student learning*	192/85.3%	16/7.1%	0/0.0%	0/0.0%	17/7.6%
Conducts meaningful Parent Teacher Conferences*	185/82.2%	19/8.4%	1/0.4%	1/0.4%	19/8.4%
Dedicates individual time to students*	194/86.2%	12/5.3%	0/0.0%	1/0.4%	18/8.0%
Employs a wide variety of teaching methods*	183/81.3%	21/9.3%	0/0.0%	2/0.9%	19/8.4%
Maintains adequate records of student progress*	172/76.4%	29/12.9%	10.4%	3/1.3%	20/8.9%
Manages student behavior*	190/84.4%	15/6.7%	0/0.0%	1/0.4%	19/8.4%

Table 4.5

Characteristics of Agriculture Teachers in Colorado Ag Ed Programs

Frequency Counts and Percentage of Responses (continued)

Statements Relating to Characteristics of Agriculture Teachers	Important and locally implemented **Count/%**	Important but NOT locally implemented **Count/%**	NOT Important but locally implemented **Count/%**	NOT important and NOT locally implemented **Count/%**	Number and Percent Respondents Missing **Count/%**
Motivates students to learn*	184/81.8%	21/9.3%	0/0.0%	1/0.4%	19/8.4%
Organizes and supervises teaching laboratories*	180/80.0%	21/9.3%	2/0.9%	1/0.4%	21/9.3%
Clearly defines expected behavior of students*	189/84.0%	16/7.1%	01/004%	1/0.4%	19/8.4%
Writes lesson plans*	172/76.4%	30/13.3%	1/0.4%	1/0.4%	21/9.3%
Continues training for an advanced degree (Master's Degree)*	117/52.0%	59/26.2%	4/1.8%	16/7.1%	29/12.9%
Has a degree in an agriculture-related field*	158/70.2%	11/4.9%	4/1.8%	10/4.4%	42/18.7%
Has a full vocational credential in agriculture*	200/88.9%	7/3.1%	0/0.0%	0/0.0%	18/8.0%

Table 4.5

Characteristics of Agriculture Teachers in Colorado Ag Ed Programs

Frequency Counts and Percentage of Responses (continued)

Statements Relating to Characteristics of Agriculture Teachers	Important and locally implemented **Count/%**	Important but NOT locally implemented **Count/%**	NOT Important but locally implemented **Count/%**	NOT important and NOT locally implemented **Count/%**	Number and Percent Respondents Missing **Count/%**
Has a professional license from Colorado Department of Education in agriculture*	188/83.6%	11/4.9%	3/1.3%	1/0.4%	22/9.8%
Participates in local professional development*	188/83.6%	12/5.3%	1/0.4%	2/0.9%	22/9.8%
Participates in the Ag Ed Summer Conference (Ag Ed Professional development)*	175/77.8%	23/10.2%	1/0.4%	1/0.4%	25/11/1%
Joins professional organizations (Colorado Vocational Agriculture Teachers Association – CVATA)*	184/81.8%	13/5.8%	4/1.8%	3/1.3%	21/9.3%
Develops strong relationships with school faculty, parents, agribusiness leaders, community leaders etc.*	196/87.1%	11/4.9%	0/0.0%	1/0.4%	17/7.6%

Table 4.5

Characteristics of Agriculture Teachers in Colorado Ag Ed Programs

Frequency Counts and Percentage of Responses (continued)

Statements Relating to Characteristics of Agriculture Teachers	Important and locally implemented **Count/%**	Important but NOT locally implemented **Count/%**	NOT Important but locally implemented **Count/%**	NOT important and NOT locally implemented **Count/%**	Number and Percent Respondents Missing **Count/%**
Presents a positive professional image*	191/84.9%	14/6.2%	0/0.0%	2/0.9%	18/8.0%
Lives within the school community*	159/70.7%	29/12.9%	5/2.2%	14/6.2%	18/8.0%
Participates in community functions*	178/79.1%	19/8.4%	4/1.8%	5/2.2%	19/8.4%
Participates in school activities outside of the ag program*	175/77.8%	21/9.3%	7/3.1%	4/1.8%	18/8/0%
Provides assistance to school personnel, other teachers and community members*	193/85.8%	11/14.9%	3/1.3%	0/0.0%	18/8.0%

* Characteristics identified as receiving over 50% of responses and having highest responses in "Important and Implemented." These characterize Ag Ed resources in Colorado.
Shaded items have over 75% plurality of responses in "Important and Implemented."
** Identified as characteristics with highest frequency counts of "Important but NOT Implemented."

Characterizing Program Management

Program Management resource refers to the characteristics of marketing, management, facilities and communication in agricultural education. Data were collected in section VI of the survey (Appendix A). Survey responses, collective of all groups, can be found in Table 4.6.

All but two survey items can be considered as characteristic of Ag Ed programs. The highest counts in "Important and Implemented" were: adequately manages tools, supplies and materials (84.0%), provides guidance and assistance to students about post-secondary education options (82.2%), maintains an appropriate annual budget (81.3%), has well maintained classrooms and laboratories (80.0%) and students are actively recruited into the program (78.7%). Program Management resource was deemed as "Effective" on a six point scale of "Very Effective" to "Very Ineffective" ($M = 1.73$, $SD = .715$) as 103 individuals or 45.8% of respondents characterized Program Management in Colorado Ag Ed programs to be effective. Fifteen of 17 Program Management characteristics had at least a majority response; 10 of these 15 had responses over 75 percent as "Important and Implemented" as seen in the shaded areas of Table 4.6.

Two characteristics within the Ag Ed resource of Program Management are not characteristic in Colorado Ag Ed programs, as they did not have majority responses as the "Important and Implemented." The characteristics were an Adult (Young Farmer) program is conducted (21.3%), and the program has an active FFA Alumni Chapter (30.2%). Both responses had plurality of responses as "Important, but NOT implemented."

Table 4.6

Characteristics of Program Management in Colorado Ag Ed Programs

Frequency Counts and Percentage of Responses

Program Management Statements	Important and locally implmnted **Count/%**	Import but NOT locally implmnted **Count/%**	NOT Import but locally implmnted **Count/%**	NOT Import and NOT locally implemented **Count/%**	Number and Percent Respondents Missing **Count/%**
Has an active and well-balanced advisory committee in place that conducts regular business meetings*	175/77.8%	26/11.6%	1/0.4%	0/0.0%	23/10.2%
Information is communicated to parents*	175/77.8%	26/11.6%	1/0.4%	0/0.0%	23/10.2%
Reports are completed for local and state administrators in a timely manner*	173/76.9%	25/11.1%	3/1.3%	0/0.0%	24/10.7%
An adult (Young Farmer) program is conducted**	48/21.3%	108/48.0%	4/2.2%	41/18.2%	23/10.2%
Program activities are based upon needs assessments or interest surveys*	118/52.4%	71/31.6%	2/0.9%	9/4.0%	25/11.1%
Maintains an appropriate annual program budget*	183/81.3%	18/8.0%	2/0.9%	0/0.0%	22/9.8%
Has implanted an effective public relations program*	165/73.3%	33/14.7%	1/0.4%	3/1.3%	23/10.2%

Table 4.6

Characteristics of Program Management in Colorado Ag Ed Programs

Frequency Counts and Percentage of Responses (continued)

Program Management Statements	Important and locally implmnted **Count/%**	Important but NOT locally implmnted **Count/%**	NOT Important but locally implmnted **Count/%**	NOT Important NOT locally implemented **Count/%**	Number and Percent Respondents Missing **Count/%**
Embeds graduation standards in agriculture curriculum*	163/72.4%	35/17.3%	2/0.9%	2/0.9%	23/10.2%
Has well maintained classroom and laboratories (shops, farms, greenhouses, etc.)*	180/80.0%	26/11.6%	0/0.0%	0/0.0%	19/8.4%
Adequately manages tools, supplies and materials*	189/84.0%	18/8.0%	0/0.0%	0/0.0%	18/8.0%
Facilities and equipment meet all safety standards*	176/78.2%	26/11.6%	0/0.0%	0/0.0%	23/10.2%
Has an active FFA Alumni chapter**	68/30.2%	100/44.4%	4/1.8%	29/12.9%	24/10.7%
Provides guidance and assistance to students about post-secondary education options*	185/82.2%	19/8.4%	0/0.0%	1/0.4%	20/8.9%
Students are actively recruited to the program*	177/78.7%	26/11.6%	1/0.4%	2/0.9%	19/8.4%

Table 4.6

Characteristics of Program Management in Colorado Ag Ed Programs

Frequency Counts and Percentage of Responses (continued)

Program Management Statements	Important and locally implmnted **Count/%**	Import but NOT locally implmnted **Count/%**	NOT Import but locally implmnted **Count/%**	NOT Import and NOT locally implemented **Count/%**	Number and Percent Respondents Missing **Count/%**
Student enrollment in Ag Ed is similar to diversity of school enrollment*	165/73.3%	37/16.4%	3/1.3%	0/0.0%	20/8.9%
There is an adequate student to teacher ratio (enough teachers)*	174/77.3%	28/12.4%	2/0.9%	0/0.0%	21/9.3%
Enrollments in Ag Ed are strong*	160/71.1%	41/18.2%	1/0.4%	1/0.4%	22/9.8%

* Characteristics identified as receiving over 50% of responses and having highest responses in "Important and Implemented." These characterize Ag Ed resources in Colorado. Shaded items have over 75% plurality of responses in "Important and Implemented."

** Identified as characteristics with highest frequency counts of "Important but NOT Implemented."

Characterizing Program Support

The final resource to be characterized in research question one pertained to Ag Ed Program Support. Program Support characteristics described the management of funding, adequate funding and the support of Ag Ed constituents and support for extended contacts and release hours. Responses to the characteristics are summarized in Table 4.7.

The statements regarding the resource of Program Support can be found in Section VII of Appendix A.

Responses indicate that 15 of 16 characteristics were characteristic of Colorado Ag Ed programs due to the highest percentages reporting in the "Important and Implemented" choice. 87.1% of respondents reported that contributors to the program were recognized, 84.9% said that program budgets were managed appropriately for district policies, 84.9% said that programs had community support, 84.4% reported that the instructor had a planning hour and finally, 83.1% of respondents characterized Ag Ed programs as having volunteers contribute to the success of the program. Program support was rated on a five point scale from "Very High" to "Very Low." Participants perceived that Colorado Ag Ed programs could be best characterized as having "Very High" program support (102 respondents, 45.3%, $M = 1.63$, $SD = .722$). Only one statement had percentages below majority (50%) and hence is not characteristic of Ag Ed programs. This statement was: The instructor has a release hour for SAEP visits and planning; 104 respondents (46.2%) said this was "Important and Implemented," yet the majority did not identify it as characteristic of Colorado programs.

Table 4.7

Characteristics of Program Support in Colorado Ag Ed Programs Frequency Counts and Percentage of Responses

Program Support Statements	Important and locally implemented **Count/%**	Important but NOT locally implemented **Count/%**	NOT Important but locally implemented **Count/%**	NOT important and NOT locally implemented **Count/%**	Number and Percent Respondents Missing **Count/%**
Program is able to raise adequate funds for FFA activities*	178/79.1%	23/10.2%	0/0.0%	1/0.4%	23/10.2%
Program manages budgets appropriately for district policies*	191/84.9%	11/4.9%	0/0.0%	0/0.0%	23/10.2%
Program has funding for necessary supplies*	162/72.0%	42/18.7%	0/0.0%	0/0.0%	21/9.3%
There is an adequate yearly budget*	148/65.8%	55/24.4%	0/0.0%	0/0.0%	22/98%
The program identifies potential partners in the community*	172/76.4%	29/12.9%	1/0.4%	0/0.0%	23/10.2%

Table 4.7

Characteristics of Program Support in Colorado Ag Ed Programs Frequency Counts and Percentage of Responses (continued)

Program Support Statements	Important and locally implement **Count/%**	Important but NOT locally implemented **Count/%**	NOT Important but locally implemented **Count/%**	NOT important and NOT locally implemented **Count/%**	Number and Percent Respondents Missing **Count/%**
Has a vehicle available solely to the program for student visits, travel and obtaining supplies*	132/58.7%	61/27.1%	2/0.9%	9/4.0%	21/9.3%
Instructor has a planning hour*	190/84.4%	8/3.6%	1/0.4%	0/0.0%	26/11.6%
Instructor has a release hour for SAEP visits and planning	104/46.2%	84/37.3%	1/0.4%	7/3.1%	29/12.9%
Instructor has an extended contract for summer duties*	176/78.2%	21/9.3%	1/0.4%	2/0.9%	25/11.1%
Program has funds for capital purchases*	137/60.9%	63/28.0%	0/0.0%	1/0.4%	24/10.7%
Program has support of school administrators*	183/81.3%	20/8.9%	0/0.0%	0/0.0%	22/9.8%

Table 4.7

Characteristics of Program Support in Colorado Ag Ed Programs Frequency Counts and Percentage of Responses (continued)

Program Support Statements	Important and locally implement **Count/%**	Important but NOT locally implemented **Count/%**	NOT Important but locally implemented **Count/%**	NOT important and NOT locally implemented **Count/%**	Number and Percent Respondents Missing **Count/%**
Program has support of school board or local education agency*	185/82.2 %	19/8.4%	0/0.0%	0/0.0%	21/9.3%
Program has community support*	191/84.9 %	13/5.8%	0/0.0%	0/0.0%	21/9.3%
Volunteers contribute to the success of Ag Ed program*	187/83.1 %	16/7.1%	0/0.0%	0/0.0%	22/9.8%
Program has support of faculty in the school outside of the ag program*	181/80.4 %	21/9.3%	10.4%	0/0.0%	22/9.8%
Contributors to the program are recognized*	196/87.1 %	7/3.1%	0/0.0%	0/0.0%	22/9.8%

* Characteristics identified as receiving over 50% of responses and having highest responses in "Important and Implemented." These characterize Ag Ed resources in Colorado. Shaded items have over 75% of responses in "Important and Implemented."

** Identified as characteristics with highest frequency counts of "Important but NOT Implemented."

Association of Resource Characteristics to Sustainability

Understanding sustainability within the context of Colorado Ag Ed required that associations between the resources and sustainability were explored (RQ2). Respondents were asked to rate their perceptions of the effectiveness of Organization and Instructional Content, FFA and Leadership Development, SAE and Experiential Learning, the Agriculture Teacher and Program Management scaled from Very Effective = 1 to Very Ineffective = 6. Similarly, respondents were asked to rate the sixth resource Program Support on a scale of Very High = 1 to Very Low = 5. These ratings were then correlated to the rating of program sustainability scaled from Very Sustainable = 1 to Very Unsustainable = 10. All stakeholder responses were used collectively in this analysis. Spearman's rho was utilized for analyzing the correlations, according to recommendations for non-parametric, ordinal data provided by Morgan, et al. (2007). Table 4.8 reports the data from the Spearman's Rho correlations.

Regarding the Effectiveness of Resources and their correlation with sustainability, all were found to have significant correlations. The highest correlation $r_s(199) = .454$, $p = .000$ was found for the measure of Program Support to Sustainability. The direction of the correlation was positive, meaning that as ratings increased for Program Support, they also increased for Sustainability. Hence, to practically look at the trends here, as ranks increased (from 1 to 5) for program support (towards Very Low support), the ranks also increased for sustainability (from 1 to 10), and moved toward Very Unsustainable. Here the effect size is approaching a larger than typical effect. The r^2 indicates that

approximately 24 percent of the variance in sustainability can be explained by the effectiveness of the Program Support resource.

Table 4.8

Association of Each Resource Effectiveness and Essentiality of Resources to Ag Ed Sustainability

Resource	Spearman's Rho	*p* value
Effectiveness of Organization and Instructional Content	.399	.000
Effectiveness of FFA and Leadership Development	.305	.000
Effectiveness of SAE and Experiential Learning	.403	.000
Effectiveness of the Agriculture Teacher	.337	.000
Effectiveness of Program Management	.453	.000
Program Support	.454	.000
Organization and Instructional Design is Essential to Sustainability	.157	.024
FFA and Leadership Development is Essential to Sustainability	.225	.001
SAE and Experiential Learning is Essential to Sustainability	.264	.000
Agriculture Instructors are Essential to Sustainability	.242	.001
Program management is Essential to Sustainability	.226	.001
Program Support is Essential to Sustainability	.195	.005

All resources and their effectiveness had positive correlations to overall sustainability and showed significant relationships.

Regarding the Essentiality of Resources (or importance), respondents were asked to rate their agreement to statements such as "Organization and instructional design is essential to the overall sustainability of the local Ag Ed program." The ratings were scaled from Strongly Agree = 1 to Strongly Disagree = 6. Respondents were asked to respond to similar statements for all resources. These responses were correlated to rating of sustainability using a Spearman rho non-parametric statistic (appropriate for ordinal data). The findings for the correlations are also reported in table 4.8. The correlations were generally smaller than those for effectiveness. The strongest correlations was for the statement "SAE and Experiential Learning is Essential to Sustainability" where $r_s(203) = .264$, $p = .000$. The positive correlation shows that as rating increased to the statement above, the rating also increased for sustainability. An r value of .23 would indicate a small to medium effect size (Morgan, et al. 2007) and the r^2 indicates that approximately 5 percent of the variance in sustainability can be predicted by the perception to the statement SAE and Experiential Learning is Essential to Sustainability. All statements were correlated to sustainability and indicated significant relationships p=.05.

Group Comparison on Effectiveness, Essentiality (Importance) and Sustainability

The third research question analyzed for this project asked if there was a difference among the three stakeholder groups in regards to their perception of sustainability (RQ3), resource effectiveness (RQ3.1) and resource essentiality (RQ3.2).

The first question of the survey asked respondents to select their role in agricultural education; administrator = 1, teacher = 2 and community member = 3. Responses in each respondent group where then compared on perceptions of sustainability (Section VIII), to the effectiveness of the resources (last question from Section II through Section VII), and the essentiality of resources (Section VIII).

Sustainability was measured on a 10 point scale where Very Sustainable = 1 and Very Unsustainable = 10. The collective mean (all three groups data considered together) was 2.32, $N = 204$, $SD = 1.367$. The principal or administrator group had the highest perception of sustainability, $M = 2.11$, $N = 53$, $SD = 1.502$ (the lower the mean indicates the greater the sustainability). The agriculture teacher group perceived sustainability as: $M = 2.33$, $N = 93$, $SD = 1.354$. The third group, the community member group perceived sustainability as: $M = 2.49$, $N = 58$, $SD = 1.251$.

Differences between the three stakeholder groups were tested using non-parametric tests. The data represented ordinal variables, a markedly positive skew (.626 to 2.659). Morgan, et al. (2007) state that the Kruskal-Wallis test is the appropriate test statistic when "data are ordinal or the assumptions of equality of group variances is violated" (p.166). Kruskal-Wallis test showed no significant differences among the three stakeholder groups (administrators, teachers, community members) regarding sustainability, χ^2 (2, $N = 204$) = 4.875, $p = .087$. Thus the null hypothesis of no difference betweens stakeholder groups on sustainability is accepted.

In Section II through Section VI of the survey, one item asked for the respondent to rate the effectiveness of the resources on a six-point scale, where Very Effective = 1

and Very Ineffective = 6. Section VII, Program Support, respondents ranked local support on a five-point scale where Very High = 1 and Very Low = 5. Table 4.9 provides the means and standard deviations of the effectiveness of the resources, by stakeholder group and total for all participants.

A Kruskal-Wallis test was again used to determine if there were any differences in the perceptions of the three stakeholder groups regarding the overall effectiveness of the six Ag Ed resources. Two items, effectiveness of SAE and Experiential Learning (χ^2 (2, N = 203) = 7.67, p = .022) and effectiveness of the Agriculture Teacher (χ^2 (2, N = 205) = 7.49, p = .024) showed significant differences among the three stakeholder groups (Table 4.10). The null hypothesis was rejected for these two resources and accepted for the remaining four resources (Organization and Instructional Content, FFA, Program Management and Program Support).

A Mann-Whitney post hoc test compared the three stakeholder groups on Effectiveness of SAE and Experiential Learning and Effectiveness of the Agriculture Teacher. Statistical significance was determined by using a Bonferonni corrected p value of .017. The mean rating for SAE and Experiential Learning by the Agriculture Teacher (79.41, n = 92) was significantly higher than that of the Principal or Administrator (61.88, n = 53), z = -2.59, p = .009, r = -.22, a small to medium effect size according to Morgan, et al. (2007). Regarding the Effectiveness of the Agriculture Teacher, the mean rank for the agriculture teacher was significantly higher (80.40, n = 94) than that of the Principal or Administrator (64.22, n = 54), z = -2.49, p = .013, r = -.21, again a small to medium effect size according to Morgan, et al. (2007). There were no significant

differences detected between the Principal or Administrator and Community Member for these values ($p = .242$, $p = .576$, respectively) or between the Agriculture Teacher and the Community Member groups for Effectiveness of SAE and Experiential Learning and Effectiveness of the Agriculture Teacher ($p = .098$, $p = .052$, respectively).

Table 4.9

Descriptive Statistics by Group for Effectiveness of Ag Ed Resources

		Instruct-ional Content	FFA	SAE	Teacher	Program Manage-ment	Program Support
Principal or Administrator	Mean	1.75	1.45	1.81	1.43	1.59	1.50
	SD	.773	.626	.833	.690	.790	.575
	N	60	58	53	54	54	54
Agriculture Teacher	Mean	1.92	1.71	2.22	1.63	1.78	1.72
	SD	.577	.846	.993	.568	.658	.743
	N	95	92	92	94	94	93
Community Member	Mean	1.90	1.59	1.95	1.54	1.78	1.61
	SD	.742	.781	.782	.888	.727	.802
	N	58	56	58	57	58	56
Total	Mean	1.86	1.60	2.03	1.55	1.73	1.63
	SD	.684	.776	.909	.703	.715	.722
	N	213	206	203	205	206	203

Table 4.10

Kruskal-Wallis Test for Group Differences for Effectiveness of Resources

Resource	N	χ^2	*df*	*P*
Effectiveness of Organization and Instructional Content	213	3.987	2	.136
Effectiveness of FFA and Leadership Development	206	3.617	2	.164
Effectiveness of SAE and Experiential Learning	203	7.668	2	.022*
Effectiveness of the Agriculture Teacher	205	7.491	2	.024*
Effectiveness of Program Management	206	4.907	2	.086
Program Support	203	2.953	2	.228

*$p < .05$

A third Kruskal-Wallis test was utilized to determine if there were differences among the three stakeholder groups and their perceptions regarding the Essentiality of the Resources. Essentiality was measured on six-point Likert-type scale where Strongly Agree = 1 and Strongly Disagree = 6. Descriptive statistics by stakeholder group are found in Table 4.11. One resource, Essentiality of SAE, showed significant differences between the stakeholder groups, $\chi 2$ (2, $N = 206$) = 9.19, $p = .010$ (Table 4.12). The null hypothesis of no difference among groups was rejected for the SAE resource and accepted for the other five resources (Organization and Instructional Content, FFA and

Table 4.11

Descriptive Statistics by Group for Essentiality of Ag Ed Resources

		Instruct-ional Content	FFA	SAE	Teacher	Program Manage-ment	Program Support
Principal or Administrator	Mean	1.24	1.15	1.36	1.15	1.26	1.17
	N	54	54	53	54	54	54
	SD	.547	.359	.558	.408	.483	.376
Agriculture Teacher	Mean	1.23	1.32	1.59	1.18	1.28	1.20
	N	94	94	94	94	94	94
	SD	.450	.626	.710	.439	.473	.430
Community Member	Mean	1.24	1.19	1.25	1.10	1.22	1.16
	N	59	59	59	59	59	58
	SD	.536	.393	.439	.305	.457	.365
Total	Mean	1.24	1.24	1.43	1.15	1.26	1.18
	N	207	207	206	207	207	206
	SD	.500	.509	.619	.396	.470	.397

Leadership Development, the Agriculture Teacher, Program Management and Program Support). Mann-Whitney post hoc tests compared the three groups to determine which groups were significantly different. Significance was set at p =.017 to account for the Bonferonni correction. The Mann-Whitney test showed mean ranks of the agriculture teachers was significantly higher (83.95, n = 94) than that of the Community Members (65.92, n = 59), z=-2.86, p = .004, r = -.23, defined as a small to medium effect according to Morgan, et al. (2007).

Table 4.12

Kruskal-Wallis Test for Group Differences for Essentiality of Resources

Resource	N	χ^2	*df*	*P*
Organization and Instructional Design is Essential to Sustainability	207	.178	2	.915
FFA and Leadership Development is Essential to Sustainability	207	2.988	2	.224
SAE and Experiential Learning is Essential to Sustainability	206	9.188	2	.010*
Agriculture Instructors are Essential to Sustainability	207	1.121	2	.571
Program management is Essential to Sustainability	207	.709	2	.820
Program Support is Essential to Sustainability	206	.397	2	.228

*p <.05

Association of Demographic Characteristics to Sustainability

The goal of this portion of the research is to determine if the demographic characteristics were predictors of Ag Ed sustainability. Group data of time affiliated with the school, time employed in the profession, school enrollment, Ag Ed enrollment, and Ag Outlook in the local area in the next five years was included in the regression equation. The data came from Section I (ordinal data) and Section VIII regarding sustainability (where 1 = Very Sustainable and 10 = Very Unsustainable). The means,

standard deviations and intercorrelations can be found in Table 4.13. The combination of variables to predict sustainability was statistically significant, F (5,134) = 7.167, p<.000. The beta coefficients are presented in Table 4.14. The demographic characteristics of School Enrollment, Ag Ed Enrollment, and Ag Industry Outlook significantly explain sustainability when all variables are included. The adjusted R^2 value was .172. This indicates that this model explains about 17 percent of the variance in sustainability. According to Morgan, et al. (2007) this is a medium to large effect.

The research findings failed to accept the null hypothesis of no predictability for school enrollment, Ag Ed enrollment, and agriculture industry perception. These items were significant predictors of sustainability. The null hypothesis was accepted for time affiliated with the sustainability.

Table 4.13

Means, Standard Deviations, and Intercorrelations for Sustainability and Predictor Variables (N = 149)

Variable	M	SD	Time Affiliated with School	Time Employed in Profession	School Enroll-ment	Ag Ed Enroll-ment	Ag Outlook – 5 Yrs
Sustainability	2.29	1.42	.093	.004	.220*	-.163*	.327*
Time Affiliated with School	2.89	1.61	---	.506*	.062	-.002	.120
Time Employed in Profession	3.52	1.65		---	.012	-.033	.058
School Enrollment	4.15	1.72			---	.334*	.111
Ag Ed Enrollment	4.00	3.53				---	-.016
Ag Outlook – 5 Yrs	1.88	.592					---

*$p<.05$

Table 4.14

Simultaneous Multiple Regression Analysis Summary for Time Affiliated with School, Time Employed in Profession, School Enrollment, Ag Ed Enrollment and Ag Outlook in Five Years Predicting Sustainability (N = 149)

Variable	*B*	*SEB*	β
Time Affiliated with School	.062	.077	.071
Time Employed in Profession	-.051	.075	-.059
School Enrollment	.220	.066	.267*
Ag Ed Enrollment	-.100	.032	-.250*
Ag Outlook – 5 Yrs	.691	.182	.289*
Constant	.474	.470	

*$P<.05$

CHAPTER 5: DISCUSSION

Summary of Findings

The purpose of the study was four-fold: first to understand if Colorado Ag Ed programs are perceived as sustainable; second, to determine the characteristics of important resources in agricultural education, namely Organization and Instructional Design, FFA, SAE, the Ag Teacher, Program Management and Program Support; third, to determine the impact of these resources on program sustainability; and finally, to understand the demographics that might impact sustainability. Knowledge of sustainability may help policy makers to develop models for program growth consistent with the state and national strategic plans for growth of Ag Ed programs.

This chapter will summarize the findings from the study, the implications drawn from findings, and the goals for future research. The findings of this study are summarized by the purposes of this study and corresponding research questions.

Purpose 1: Understanding Sustainability relating to Colorado Ag Ed

The first purpose of the study was to understand if agricultural education in Colorado was sustainable. Akerlund (2000) defined sustainable programs as those that are "endurable, livable, adaptable and supportable" (p. 354). This study asked respondents to rate their perception of sustainability and the four sustainability factors described by Akerland of agricultural education. Overwhelmingly, agricultural education in Colorado is perceived as sustainable. Sustainability was measured on a 10 point scale where Very Sustainable = 1 and Very Unsustainable = 10. The collective mean (all

respondents data considered together) was 2.32, $N = 204$, $SD = 1.37$. The range of responses regarding sustainability was from one to nine. Each of Akerlands' factors (endurable, livable, adaptable, supportable) of sustainability was also rated according to the perceptions of the three groups, and Ag Ed was again positive on all factors. Collective mean perceptions were: longevity (endurable) $M = 1.47$, $SD = .735$, livable $M = 1.42$, $SD = .618$, adaptable $M = 1.53$, $SD = .726$ and supportable, $M = 1.35$, $SD = .571$ (all were scored on Likert-type items on a scale of strongly agree = 1 to strongly disagree = 6). Agricultural education in Colorado is perceived to be sustainable, and also showed high levels of agreement according to the frequency counts of participant perceptions for corresponding sustainability factors of longevity, livability, adaptability, and supportability were also found. These findings provide the framework for interpretation of the remaining purposes and research questions.

Purpose 2: Determine the Characteristics of Important Resources in Agricultural Education

This purpose corresponded to research question 1 (RQ1). The premise behind this question is that sustainability is related to resources, their availability, utilization and consumption (Hartter & Boston, 2007). As stated by Hartter & Boston (2007), identification of resources is alone not enough to promote sustainability; rather to study sustainability necessitates an understanding of these resources, how they are implemented and if they are effectively used. Sustainability, as it relates then to the perceptions of the make-up of the resources, can then be adequately studied. Six resources have been

identified in agricultural education. Each of these resources was characterized in three ways: Important and Implemented by over 50 percent of the respondents, Important and Implemented by over 75 percent of the respondents and finally resources were characterized according to their effectiveness. Table 5.1 has the Organization and Instructional Content Resource characteristics listed in descending order of Important and Implemented responses.

Findings show a change in the perceived nature of Colorado Ag Ed programs and how our programs are offered. Certainly consistent with previous generations of agricultural education in Colorado, the top three curricular areas were Agribusiness, Animal Science and Plant Sciences (Scott Stump, personal communication, March 2, 2007). Traditionally agricultural mechanics has also been a very strong emphasis, although responses here indicate a discrepancy with the presence of available facilities (83.6 percent) and those who were teaching it (72.9 percent). This discrepancy may be due to the fact that this is not emphasized in teacher preparation programs, and hence while the facilities are available for teaching, many teachers may not feel competent to teach it (Bessire, 2007). Other items that are representative of Ag Ed programs in Colorado is the integral nature of FFA and leadership development, Ag Ed notebooks being used as a method of student organization and lesson plans that match the approved course of study. These are all characteristics that have been implemented for many years in Colorado, and these items still appear in a majority of our Ag Ed programs.

Table 5.1

Statements of Organization and Instructional Design Resource in Descending Order of Percent Responses Indicating Statement is Important and Implemented

Organization and Instructional Content Statements	Percent Responses Important and Implemented
Course content includes Agribusiness*	89.3
The program reinforces important academic concepts*	89.3
Leadership development (FFA) is integral to instructional delivery and is taught in the classroom*	88.9
Lesson plans are utilized and match approved course of study*	88.4
Course content includes Animal Science*	88.4
Students of all ability levels are enrolled in the program*	88.4
Course content includes Plant Science*	86.2
Program design and content are based upon input from stakeholders (students, parents, advisory committee)*	84.0
A shop or mechanics facility is available for instruction*	83.6
Students with disabilities take courses in Ag Ed*	82.7
Ag Ed notebooks are utilized*	76.4
Program is based on student interest*	76.4
Instructional content is delivered in problem-based format (problems and solutions)*	73.8
Course content is delivered in Power, Structure and Technical systems (mechanics)*	72.9
Ag Ed courses are aligned along career pathways (such as Animal Science or Agribusiness)*	67.6
Course content includes Natural Resources*	66.7
Course content includes Environmental Sciences*	64.4
Engagement activities (or E-moments) are utilized and integrated into instruction*	62.7
Students have an agriculture occupational objective (plan to be employed in agriculture)*	59.6

Table 5.1

Statements of Organization and Instructional Design Resource in Descending Order of Percent Responses Indicating Statement is Important and Implemented

Organization and Instructional Content Statements	Percent Responses Important and Implemented
Ag Ed courses receive academic credit (i.e. In science, math or speech) *	57.8
Ag Ed is offered in both formats (Ag I/Ag II & pathways)*	54.2
Ag Ed courses are in Ag I/Ag II/Ag III/IV format	45.8
A greenhouse is available for instruction	44.4
Course content is delivered in Food Science and Products**	39.1
The program offers courses for college credit**	24.9
A school farm is available for instruction**	21.3

* Characteristics identified as receiving over 50% of respondents and having highest responses in "Important and Implemented." These characterize Ag Ed resources in Colorado. Shaded items have over 75% plurality of responses in "Important and Implemented."

** Identified as characteristics with highest frequency counts of "Important but NOT Implemented."

Agricultural education has touted the benefits of teaching in a hand's-on manner. While 83.6 percent of programs have a mechanics facility, 44.4 percent utilize a greenhouse and 21.3 percent utilize a school farm. Funding is likely a limiting factor in providing these laboratory settings, according to responses to provided in to the open-ended questions at the end of the survey.

A push in the last two years has been to move Ag Ed curriculum along Career Pathways (Colorado Career Cluster Model, 2007). This is a focused look at secondary

curriculum along structured content areas, in opposition to the traditional mode of delivery where all content was delivered in a broad spectrum approach in classes Agriculture I through Agriculture IV. It appears that this change has been implemented as respondents said that Ag Ed courses were aligned along career pathways at a much higher percentage (67.6) than along Ag I/II/III/IV courses (45.8). Traditionally, Ag Ed has been occupationally driven; those students with a desire to return to agriculture (traditionally the farm) should enroll in Ag Ed (Cook, 1947). This, too, is changing, as 59.6 percent of respondents said that it is "Important and Implemented" to have students pursuing an occupational objective in agriculture. Yet, Ag Ed is at a cross-road on whether the objective is to reinforce academic attainment or the historic vocational nature of the programs. Respondents reported that 88.9 percent of the time it is important and implemented that academic concepts are reinforced; however 59.8 percent of respondents said that academic credit was given. These findings indicate that the respondents perceived that it was important for Ag Ed programs to reinforce academic concepts, rather than to replace the typical academic offerings.

Responses to the open-ended questions also discussed the implications of change occurring Organization and Instructional Design. A respondent commented that: "Curriculum and projects need to keep up with the times. For instance, we have been discussing at our high school to explore the renewable energy areas and perhaps even put a working wind turbine at our school that would benefit our program and our overall school expenses. Stay current with the times and encourage students to go into fields of technology, biofuels, etc..." Another commented: "To strengthen the sustainability of

agricultural education we need to make sure we continue to adapt with the time. Making sure we offer courses which will benefit the agriculture AND Natural Resources industries. Agriculture as an industry and thus agriculture education is only going to survive if we work and teach about the environment. If Ag Ed can continue to adapt with the industry, and keep the industry and the local community involved, then we are sustainable."

Responses for FFA and Leadership Development showed that most respondents viewed the characteristics as "Important and Implemented" in Colorado Ag Ed Programs. Table 5.2 outlines the characteristics of FFA and Leadership Development in descending order of the percentage responses in "Important and Implemented." While FFA has broadened and expanded over the years, Colorado programs are very consistent with how FFA programs are delivered. Ninety-two percent of respondents indicated that having a local FFA chapter was both "Important and implemented." Few programs in Colorado would offer alternative forms of leadership development (i.e., Student council); these programs would be considered to be non-traditional Ag Ed programs typically offered at vocational training centers. Programs in Colorado appear to offer local, state, and national opportunities for their students. While the activities of an FFA Chapter can be overwhelming for a teacher to implement, it does seem as though Colorado programs are able to implement many opportunities for students. The lowest response for "Important and Implemented" corresponded to the statement: All students are FFA members. This is an ongoing debate on whether a mandatory function of Ag Ed programs is that all students are also FFA members. While it is highly recommended, the additional dues

structure does make it legally impossible to require FFA of all students. This issue is currently being discussed at a national level. The proposal would allow for a chapter to pay an affiliation fee and not an individual fee for each member, thereby indicating the importance of the integral nature of FFA and Ag Ed (K.Oschner, personal communication, November 9, 2007). Overall, all the characteristics listed in this survey are considered to be typical of FFA chapters in Colorado.

Responses to the open-ended questions included comments regarding FFA and Leadership Development. When asked what could strengthen the future of Ag Ed sustainability, stakeholders responded, "Continue demonstrating the benefits and leadership development that FFA provides" and "administrators [need] to recognize the quality of leadership that comes from being a FFA member and how that helps the school as a whole."

Table 5.2

Statements of FFA and Leadership Development Resource in Descending Order of Percent Responses Indicating Statement is Important and Implemented

FFA and Leadership Development Statements	Percent Responses Important and Implemented
There is a local FFA Chapter*	92.0
The chapter annually participates in State/National FFA activities*	89.3
The FFA Chapter conducts community service activities*	88.0
The chapter elects and trains a capable officer team*	87.6
There is a local FFA banquet*	87.1
Students are prepared for Career Development Events (also called judging contests)*	86.7
FFA members apply and receive the Greenhand FFA Degree*	85.3
FFA members apply and receive the Chapter FFA Degree*	84.0
The FFA participates in chapter traditions*	83.1
The chapter conducts fun, well-planned, regularly scheduled meetings*	82.7
The chapter has ample fund-raising activities*	82.7
The FFA uses a workable constitution and bylaws*	82.2
Chapter conducts 10 local activities (or more) each year*	80.0
FFA members apply and receive the State FFA Degree*	79.1

Table 5.2

Statements of FFA and Leadership Development Resource in Descending Order of Percent Responses Indicating Statement is Important and Implemented (continued)

FFA and Leadership Development Statements	Percent Responses Important and Implemented
The chapter develops a challenging program of activities*	77.3
Members apply for award applications (proficiency, star awards, entrepreneurship, agriscience, etc.)*	76.0
FFA membership reflects the diversity of the school enrollment*	71.6
Members complete proficiency applications*	71.1
FFA members apply and receive the American FFA Degree*	68.4
The local chapter participates in the National Chapter Awards program (completes the application) each year*	66.2
All students in Ag Ed are FFA members*	62.7

* Characteristics identified as receiving over 50% of respondents and having highest responses in "Important and Implemented." These characterize Ag Ed resources in Colorado. Shaded items have over 75% plurality of responses in "Important and Implemented."

** Identified as characteristics with highest frequency counts of "Important but NOT Implemented."

SAE and Experiential Learning is the program component in Agricultural Education undergoing the most scrutiny nationwide. Previous research has found that SAE programs are extremely valuable yet are not implemented in the integral fashion of its inception. The success of the SAE lies in the ability of the teacher to construct, deliver and supervise effective curriculums (Ives & Obenchain, 2006; Swortzel, 1996), however,

in a nationwide study last year, only 9 percent of administrators nationwide had any knowledge of SAE programs being implemented in local Ag Ed programs (National Council, 2007). Additionally, anecdotal, unpublished research finds that most of the best and brightest new teachers across the nation are not making SAE program visits or adequately implementing SAE as it was intended (Dr. Jack Elliott, Arizona Agricultural Education, personal communication, January 31, 2008). These findings confirm that SAE's are not effectively implemented.

The perceptions found in this study appear to concur with these other findings. SAE perceptions of "Important an Implemented" characteristics showed much less agreement than in the other resources studied (Curriculum Design and Instruction, FFA and Leadership Development, Agriculture Teachers, Program Management, and Program Support). Table 5.3 outlines the SAE and Experiential Responses by descending order of percentage responses rated as "Important and Implemented" according to this research. While all but two characteristics could be defined as typical in Colorado Ag Ed programs, there was a much lower responses indicating "Important and Implemented," fewer characteristics that are implemented in over 75 percents of the programs and more variability in responses. Further, while SAE was overall considered to be "Effective," this resource has the lowest overall mean ($M = 2.03$) and the highest standard deviation (.909) of all resource effectiveness measures.

Table 5.3

Statements of SAE and Experiential Learning Resource in Descending Order of Percent Responses Indicating Statement is Important and Implemented

SAE and Experiential Learning Statements	Percent Responses Important and Implemented
SAE and work-based learning are integrated into the curriculum*	84.0
Students manage their own SAE*	80.9
Class time is utilized to plan, coordinate, and update records related to the SAE*	77.8
SAEs are diverse (provide a variety of experiences for students)*	76.9
Students have up to date records of their SAE*	76.0
SAEs are linked to the curriculum and careers*	75.1
Teacher provides adequate supervision for SAEs*	74.7
The students SAEs are related to an agriculture pathway (i.e. animal systems, ag mechanical or technical systems, food systems)*	74.2
Student SAEs last over a period of 6 months*	73.3
The instructor conducts one visit to students SAE yearly *	72.4
Parents assist with SAEs*	72.4
Students are recognized for their SAEs through local awards programs*	71.1
The students maintain records using a computer application*	70.2
Adequate evidence of SAE visits are maintained*	68.0
All students conduct viable and meaningful SAE programs*	65.8
Student SAEs extend over 360 hours yearly*	65.3
Students have a Long-Time Plan that allows for SAE expansion and further development*	61.8
School facilities are provided to meet the needs of students SAEs*	53.3
Students enrolling in Ag Ed are visited before the first school year	40.9
The instructor conducts three visits to students SAE yearly **	34.2

Responses to this survey would indicate that Colorado Ag Ed integrates SAEs into the curriculum and utilizes class time to update records and link them to careers in agriculture. There is less consistency of responses in "Important and Implemented" regarding supervision activities and that all student conduct meaningful SAE, consistent with other findings in literature (Swortzel, 1996; Dyer & Osborne, 1995). Time considerations in making supervised visits to student programs, fewer summer contracts and a broadening definition of SAE may have evolved this resource that is no longer consistently implemented in Colorado.

Extensive literature has been written regarding the teacher and qualities which make one an effective teacher. In agricultural education, much of the recent literature has focused on the lack of retention of teachers, in-service needs for teachers, and the drastic teacher shortages facing the profession (Kantrovich, 2007). This survey found that all of the statements adequately characterized the teacher resource as over 50 percent of respondents indicated they were "Important and Implemented." Table 5.4 describes the Characteristics of Agriculture Teachers Statements in descending order of "Important and Implemented." All but three of the statements were "Important and Implemented" by over 75 percent of the respondents. Teachers appear to implement effective teaching practices (advocating for students, motivating students to learn) as well as habits of the profession (joining the professional organization, participating in professional development). Overall, the view of teachers in Colorado was very positive; responses indicating teachers were either Very Effective or Effective ($M = 1.55$).

Table 5.4

Statements of the Agriculture Teacher Resource in Descending Order of Percent Responses Indicating Characteristic Important and Implemented

Agriculture Teacher Statements	Percent Responses Important and Implemented
Has a full vocational credential in agriculture*	88.9
Develops strong relationships with school faculty, parents, agribusiness leaders, community leaders etc.*	87.1
Advocates for needs and cares for students*	86.7
Dedicates individual time to students*	86.2
Provides assistance to school personnel, other teachers and community members*	85.8
Assesses and evaluates student learning*	85.3
Presents a positive professional image*	84.9
Manages student behavior*	84.4
Clearly defines expected behavior of students*	84.0
Has a professional license from Colorado Department of Education in agriculture*	83.6
Participates in local professional development*	83.6
Conducts meaningful Parent Teacher Conferences*	82.2
Motivates students to learn*	81.8
Joins professional organizations (Colorado Vocational Agriculture Teachers Association – CVATA)*	81.8
Employs a wide variety of teaching methods*	81.3
Organizes and supervises teaching laboratories*	80.0
Participates in community functions*	79.1
Participates in the Ag Ed Summer Conference (Ag Ed Professional development)*	77.8
Participates in school activities outside of the ag program*	77.8
Maintains adequate records of student progress*	76.4
Writes lesson plans*	76.4
Lives within the school community*	70.7
Has a degree in an agriculture-related field*	70.2
Continues training for an advanced degree (Master's Degree)*	52.0

Nevertheless, the need and concern about the quality of teachers is persistent in the open-ended responses. Many stakeholders commented that strengthening Ag Ed sustainability in the future would be through the teacher resource: "A teacher who will stay for a period of time and build a program," "More qualified teachers entering the profession of Agriculture Education," and "New teachers need to have in-depth training on how to balance their job with their life and avoid burnout. If they can manage this, they will be more apt to stay longer, and this continuity will be very beneficial, both in terms of program quality and new teacher recruitment." An adequate supply of trained teachers who can implement the total Ag Ed program will be a focus for Ag Ed in Colorado.

Program management refers to the overall programmatic workings of an Ag Ed program. Program Management statements are presented in descending order of "Important and Implemented" in Table 5.5. All but two statements characterized Colorado Ag Ed programs, both dealing with adult organizations; Young Farmers and FFA Alumni groups. Historically, adult organizations have been integrated into the secondary program and the agriculture teacher served as an advisor to the local adult organizations as well. Low interest in Young Farmers and increasing time commitments for local agriculture teachers have ebbed away at this program. The value of these organizations is undeniable through such comments as: "Utilize Young Farmers at the National and State levels in the state FFA contest and awards," and "On the local level the addition of a Young Farmer Program & an Alumni chapter would be very beneficial to the sustainability of Ag Ed." However the ability to effectively implement these

programs is challenging. Nevertheless, Young Farmer and Alumni programs are still valued and may be an area to reconsider to garner program support in programs.

Table 5.5

Statements of the Program Management Resource in Descending Order of Percent Responses Indicating Characteristic Important and Implemented

Program Management Statements	Percent Responses Important and Implemented
Adequately manages tools, supplies and materials*	84.0
Provides guidance and assistance to students about post-secondary education options*	82.2
Maintains an appropriate annual program budget*	81.3
Has well maintained classroom and laboratories (shops, farms, greenhouses, etc.)*	80.0
Students are actively recruited to the program*	78.7
Facilities and equipment meet all safety standards*	78.2
Has an active and well-balanced advisory committee in place that conducts regular business meetings*	77.8
Information is communicated to parents*	77.8
There is an adequate student to teacher ratio (enough teachers)*	77.3
Reports are completed for local and state administrators in a timely manner*	76.9
Has implanted an effective public relations program*	73.3
Student enrollment in Ag Ed is similar to diversity of school enrollment*	73.3
Embeds graduation standards in agriculture curriculum*	72.4
Enrollments in Ag Ed are strong*	71.1
Program activities are based upon needs assessments or interest surveys*	52.4
Has an active FFA Alumni chapter**	30.2
An adult (Young Farmer) program is conducted**	21.3

Perceptions of stakeholders regarding the Program Management resource indicate that facilities, tools, and equipment are effectively managed and that programs do a good job of insuring future enrollments through guidance, counseling, communication to parents, and through student recruitment. Seventy-one percent of respondents said that the enrollments in agricultural education are strong. This is essential for agricultural education sustainability; student interest and enrollment will need to be strong to show to administrators that the program is strong and valued.

Table 5.6 summarizes the statements pertaining to Program Support in descending order of "Important and Implemented." All but one statement adequately characterized Colorado Ag Ed Programs. Overall, support pertains to funding but is also human resource support of the program. Perceptions indicated that programs are supported in both areas. The lone statement that is not representative is in regards to the agriculture teacher having an additional "planning" hour to supervise agriculture experiences of students. Again, while SAE is deemed to be effective, this may be another reason for difficulties regarding the SAE supervision; programs have moved away from offering this as an additional support mechanism for agriculture teachers. Without this release hour, all supervision must occur after the school hours, and may indicate there are less SAE supervision visits occurring. It is encouraging that 78 percent of respondents indicated that a summer contract was still offered in their programs to provide for supervision in the summer months.

Table 5.6

Statements of the Program Support Resource in Descending Order of Percent Responses Indicating Characteristic Important and Implemented

Program Support Statements	Percent Responses Important and Implemented
Contributors to the program are recognized*	87.1
Program manages budgets appropriately for district policies*	84.9
Program has community support*	84.9
Instructor has a planning hour*	84.4
Volunteers contribute to the success of Ag Ed program*	83.1
Program has support of school board or local education agency*	82.2
Program has support of school administrators*	81.3
Program has support of faculty in the school outside of the ag program*	80.4
Program is able to raise adequate funds for FFA activities*	79.1
Instructor has an extended contract for summer duties*	78.2
The program identifies potential partners in the community*	76.4
Program has funding for necessary supplies*	72.0
There is an adequate yearly budget*	65.8
Program has funds for capital purchases*	60.9
Has a vehicle available solely to the program for student visits, travel and obtaining supplies*	58.7
Instructor has a release hour for SAEP visits and planning	46.2

* Characteristics identified as receiving over 50% of respondents and having highest responses in "Important and Implemented." These characterize Ag Ed resources in Colorado. Shaded items have over 75% plurality of responses in "Important and Implemented."

** Identified as characteristics with highest frequency counts of "Important but NOT Implemented."

Nevertheless, the persistent issue presented in the responses to the open-ended questions dealt with support. Many respondents indicated that the limiting factor in the future will be securing additional funding. Of the 165 open-ended responses to the question: "What could threaten Ag Ed sustainability in the future?" over 40 responses dealt with support or funding issues. One respondent indicated, "Budgets are always tight; the program must sustain itself by having enough students to justify a full-time teacher and program expenses." Other respondents indicated the need for funding to improve program quality: "More funding [is necessary] for expensive supplies needed to teach modern technology and challenge our student learning," and "more funding for materials such as computers, shop tools, welders, exhaust fans in shop."

In summarizing the second purpose of the study, the resources of Organization and Instructional Content, FFA and Leadership Development, SAE and Experiential Learning, the Agriculture Instructor, Program Management and Program Support have been characterized as to stakeholder perceptions of the characteristics of each resource. While research was previously conducted in agricultural education regarding the total program of Ag Ed, and these components, this is the first that these resources have been characterized in Colorado. To understand resources in Ag Ed, it is important to understanding which characteristic statements have high value in within each resource.

Purpose 3: Determine the Relationship of Resources on Program Sustainability

The third purpose of this study is to determine the relationship of resources on program sustainability. This question corresponded to RQ 2: What is the association

between the resources (Organization and Instructional Content, FFA and Leadership Development, SAE and Experiential Learning, Agriculture Teacher Characteristics, Program Management and Program Support) and sustainability in Colorado? Two different measures were correlated in this analysis: 1) the effectiveness of the resource correlated to sustainability and 2) the importance (essentiality) of the resource correlated to sustainability. Both of these correlations used the Spearman's Rho statistic. The analysis showed that effectiveness of each of the program resources were positively correlated with sustainability. Highest correlations for the effectiveness of the resource were seen in Program Support (r_s. = .454), Program Management (r_s. = .453), and SAE and Experiential Learning (r_s. = .403); followed by Organization and Instructional Content (r_s. = .399), Agriculture Teacher (r_s. = .337), and FFA and Leadership Development (r_s. = .305). All correlations are considered had medium to large effect size. Analyzing a correlation matrix of all resources considered together, each resource had significant positive correlations with one another ($p < .008$, accounting for the Bonferroni correction). This would indicate that if the perception of effectiveness increases for any resource; it would also increase for another resource, as with the perception of sustainability. Agricultural education sustainability can not be looked at as a function of one resource; instead it is a function of all of these resources. This confirms other sustainability research regarding the inter-connected nature of resources (Hartter & Boston, 2007).

The second group of Spearman's rho statistics correlated the perceptions of importance (essentiality) of the resources to sustainability. Perception of essentiality of

the resource was significantly correlated to sustainability. The strongest correlation was SAE and Experiential Learning (r_s. = .264), followed by Agriculture Instructors (r_s. = .242), Program Management (r_s. = .225), FFA and Leadership Development (r_s. = .225), Program Support (r_s. = .195), and Organization and Instructional Design (r_s. = .157). All of the essentiality measures to sustainability had a small to medium effect. Considering this, it would indicate that the current effectiveness of implementation is a stronger correlation to sustainability than the perception of the essentiality of the resources. However, all resources (both their effectiveness and perceived essentiality) are positively correlated with sustainability.

Purpose 4: Determine Demographic Relationship to Sustainability

The fourth purpose of this study was to determine if there was a significant relationship of demographic characteristics to sustainability. Two research questions corresponded to this purpose: (RQ3) Are the perceptions of agricultural education sustainability different among three stakeholder groups? and (RQ4) What is the association between the following demographics and sustainability?

Examining the findings for RQ3, all three stakeholder groups viewed Ag Ed programs in Colorado to be sustainable. There were no significant differences among the perceptions of administrators, teachers, and community members regarding sustainability. This is viewed by the researcher to be a positive outcome of this study. While many times advisory committees and teachers may view programs as sustainable, it is also good to know that local administrators, as gatekeepers of budgets and school

programmatic offerings, have similar perceptions. When significant differences existed regarding the effectiveness of the resources or the essentiality of the resources, the teachers always had the higher mean scores, meaning that the teachers actually viewed items, for example, to be less effective or less important (measured on scales where 1 was strongly agree and 6 was strongly disagree).

Agriculture teachers had significantly different perceptions from administrators regarding the effectiveness of the Agriculture Teacher and the effectiveness of the SAE and Experiential Learning resources, both having higher mean scores than administrators. Agriculture teachers perceived these two resources to be less effective than administrators did.

Regarding the essentiality (or importance) of resources, the agriculture teachers perceived SAE and Experiential Learning to be significantly different than that of the community members. The agriculture teacher had higher mean scores. The practical interpretation of this would indicate that agriculture teachers viewed SAE and Experiential Learning to be less essential (or important) than community members.

RQ4 examined if there was any predictability of sustainability based upon demographic data of whose time affiliated with the school, time employed in the profession, school enrollment, Ag Ed enrollment, and Ag Outlook for the local area in the next five years. This combination of factors, according to the perceptions in this study, can explain or predict 17 percent of the variance in sustainability. However, in the equation only school enrollment, Ag Ed enrollment, and ag outlook were significant

predictors of sustainability. This indicates that there is no association with time affiliated with the school and time employed in the profession and sustainability.

The positive correlation of agriculture industry outlook to sustainability would indicate that as perceptions increase for outlook (toward unfavorable outlook), perceptions also increase for sustainability (toward unsustainable). While respondents indicated that the outlook for the agriculture industry was favorable, many of the open-ended responses expressed concern over the changing agriculture nature of the communities. One respondent commented that sustainability is threatened in the future due to the loss of the local ag community: "The decrease in agricultural opportunities in the community. Our area is becoming more urban, farmland is decreasing while urban housing is expanding." Another respondent commented: "The total erosion of the family farm and the history of our forefathers. Less of an ag presence on Capitol Hill & at the state level fighting for agriculture and its purpose to sustaining life by providing food, fiber & fuel." And another commented: "The whole ag picture threatens our ag ed future due to the size of the farms. There are getting less and less family farms, for these kids to come back to the future. Some of the government programs are doing this to our farmers. CRP [Conservation Reserve Program] Programs are taking our farm ground out of production & letting older farmers retire which is great but prevents farms from being offered to the young people." Concern regarding the agriculture industry provided additional concern for the longevity of Ag Ed programs.

Implications of Research Findings

Implications are inherent after a discussion of the findings. The undertaking of a research project formulates a lot more questions than answers, and certainly this study is proof of this statement. There are four main implications from the findings of this study to be discussed: 1) a model for program sustainability, 2) a model for professional development, 3) a model for teacher development, and 4) a model for communication.

Initially, the goal of this research was to inform a model of program sustainability that coincides with the long-term growth initiatives of the state and national strategic plans. This research did provide a model for sustainability; however a model for a growth initiative did not necessarily emerge from the findings of this study. Through this study a better understanding exists of the resources found in Colorado Ag Ed and how these resources impact the perception of sustainability.

What is the sustainability model? This study showed that agricultural education programs in Colorado are sustainable. We also know the characteristics of six resources found in Ag Ed. Therefore, the recommended model for program sustainability is to implement the resources as is currently being done. As each resource is significantly and positively correlated to sustainability, this study shows that each resource studied in this research reveals that the resources, as characterized, are critical to sustainability and should be considered in improving local perceptions of sustainability.

Managing a total program of agricultural education can be a daunting task for anyone in the profession; however, this study through characterizing resources has narrowed what is necessary for implementation, making this more achievable. While

agricultural education programs in Colorado have the latitude to develop programs unique to local needs; perceptions of programs in this study appear to be more similar than dissimilar. This is beneficial as the programs were also perceived to be sustainable. So, will a model of sustainability assist in reaching goals related to the state and national growth initiatives? While the model currently implemented in Ag Ed is perceived to be sustainable in this study, it is important to know that there are striking similarities of the programs that participated in this research; specifically that they were located in small, rural areas (83.6% of respondents) and affiliated with small schools (64.1% of respondents from schools with enrollments less than 300 students) and small Ag Ed programs (70.5% of respondents from programs with less than 60 students enrolled in Ag Ed). Depending on the strategic growth initiatives and the growth plan for Ag Ed, the communities and schools where agricultural education could be implemented may look substantially different than the programs represented by the respondents in this study. A case may be made to the extent that all programs in this study, regardless of demographics, were perceived to be sustainable; and therefore this model of agricultural education could be implemented anywhere, regardless of demographics. However, limited responses came from varied programs could indicate that current programs are sustainable, but a second model may need to be further researched for a true growth model for agricultural education. Regardless, this research will provide a starting point for further research into a growth model.

The second implication from this study is a model for professional development. Through this study, programs were characterized as to their resources, and we determined

that these resources were correlated to sustainability. What was not revealed in this study is how these programs operationalize and practically implement Ag Ed resources. The sharing of ideas and strategies to adequately implement all resources into a total Ag Ed program is fundamental to continued success of agricultural education in Colorado. Each summer agriculture instructors come together for a week-long "Summer Institute" for the purpose of professional development. The findings from this study could lead professional development sessions for each of the six resources. Through this activity, agriculture instructors could better inform each other of successful practices employed related to each of the characteristics and resources. The sharing of ideas can improve practices of current agriculture teachers. Therefore, the study could provide an idea of what to do (based on perceptions of what is being done), and the professional development sessions could provide practical solutions for the "how" to do it.

According to the results of this study, the primary focus of professional development should initially be on SAE and Experiential Learning as this was the resource which revealed the most variability in perceptions. Further refining of this resource is necessary to provide adequate guidance to teachers, schools, and community members for ways to successfully implement the SAE into Ag Ed. This study provided many perceptions regarding SAE and Experiential Learning that could lead to excellent dialogue within the state for revision of this important resource.

The third focus area for professional development would utilize the perceptions of the resource characteristics that were deemed to be "Important but NOT Implemented." There were seven characteristics of Ag Ed resources that were perceived "Important but

NOT Implemented." These included: 1) the program offers courses for college credit, 2) there is course content in Food Science and Products, 3) there is a school farm available for instruction, 4) the instructor provides three visits to a students SAE yearly, 5) there is an adult (Young Farmer) program and 6) there is an active FFA alumni. Further analysis of the data, including disaggregating the data by respondent group, may provide insights into who values the characteristic. Then professional development could provide a forum for further training in these areas or provide opportunities for instructors to discuss the reasons why these items are perceived to be "Important" and yet have limited implementation.

The third model developed through the perceptions in this study is a model for teacher development. Through resource characterization, specific items have been identified that are implemented in the local programs. These items will provide priority training points in teacher education, providing focus to the teacher development process. As a beginning teacher, it would be practical to implement resource characteristics deemed to be "Important and Implemented" in 75 percent of the programs. In this manner, we have provided a narrowing of the necessary program components to be implemented in local programs as a new teacher begins in the profession. This framework gives a good starting point for a new teacher and would allow for them to add additional resource characteristics as they become grounded in the profession. Key to this frame will be to provide mentoring to new teachers as they implement resources. Adequate teacher development, guidance and support during the induction years of teaching may help to

ease the teacher turn-very rates in Colorado while assisting in programs becoming more manageable.

Finally, the fourth implication of this study is a model for communication. While this study was informative, many survey statements were not answered, and this is assumed to be because stakeholders were not informed enough of the local program to adequately respond. While these practices may be implemented, unless stakeholders are knowledgeable of them, the right message may not be perceived. Continual communication with administration, parents, community members and students is essential to program success. This model for communication may require a more diligent and focused approach than "the advisory committee will meet a minimum of three times per year" (Colorado Community College System, 2003, p. 6), as is recommended on our state program standards and quality indicators. While certainly the goal of meeting with an advisory committee could be to assist in disseminating program information, a communication effort should extend far beyond the meetings of the advisory committee. It is recommended that when local programs develop their five-year plans for the Colorado Community College System (utilized in order to approve programs for state and federal funding) that a communication component be incorporated as a mandatory component of their program planning. This effort may continue the communication effort in the local programs.

A communication model must, however, extend beyond the traditional local program avenues. This model should also incorporate spreading the good news about

agricultural education to new students, other faculty members, potential teachers, and administrators of schools that do not currently have Ag Ed programs.

Future Research

This study is data rich and will provide for further inquiry utilizing the data. First, each of the resources and their characteristic statements needs to be further analyzed. Each resource contained an effectiveness rating. It will be interesting to correlate responses on the statements to the effectiveness rating of each of the resources. This analysis may provide more information regarding which statement has the strongest relationship to resource effectiveness.

Second, an emerging theme from this data was the impact of the local agriculture industry on agricultural education sustainability. While the majority of respondents were favorable about agriculture, the responses to the open-ended questions revealed definite concerns regarding the agriculture industry. Sorting data by perception of the agriculture industry may provide more refined analysis of the impact of the industry on Ag Ed.

Third, it was not anticipated that so many people (n=169) would provide comments to the open-ended questions at the end of the survey. This research model was not designed to thoroughly analyze the responses but rather to utilize them to support and illustrate the findings of the statistical analysis. However, the richness of the comments necessitates a qualitative follow-up study. These perceptions may provide more practical significance than that of the statistical analysis.

As sustainability is contextual in nature, it is apparent that a follow-up study is necessary in other contexts, specifically those schools that do not have agricultural education programs. These perceptions may help to provide a model for Ag Ed growth in Colorado. It is understood that this was a study of those with knowledge of and who are supportive of Ag Ed. A study in targeted growth areas (other geographic areas, for example) that utilizes the information on resources discovered in this study will provide important information to guide the growth framework.

Finally, two other follow up studies are recommended: one studying sustainability in other Career and Technical Education programs in Colorado and the second studying agricultural education sustainability in other states. These findings may provide broader policy implications beyond agricultural education in Colorado.

Limitations

This study of Ag Ed sustainability applied to schools currently offering Ag Ed programs in Colorado. While there are many other individuals could provide perceptions as to the sustainability of Ag Ed, limitations were placed around this study to begin to establish a framework for sustainability in Colorado Ag Ed programs. Additionally, due to the dramatic agriculture teacher turn-over rate and administrator turn-over rate that is persistent in the professions, this survey may have been completed by individuals with limited historical knowledge of Ag Ed in the community that they are currently serving. This institutional knowledge, or lack thereof, may provide a very near-sighted view of sustainability; one that may necessitate a repeat of this survey in the near future.

While previous studies around agricultural education and sustainability provided the framework for studying the stated resources, the researcher acknowledges that the resources and characteristic statements may not be an all-inclusive list. As such, there may be other resources that may impact sustainability, and therefore limits the interpretation of the findings of this study. However every attempt was made to make this survey as comprehensive as possible for the purpose of studying sustainability.

Finally, while the initial goal of this study was to provide a model of sustainability which could help propel Colorado to reach long term strategic growth goals (of new programs). Findings of this study provided a model for sustainability, yet may not provide enough information for a model of growth. Limitations as to the program demographics and resources may limit these findings, depending on the demographics and resources available in projected growth areas for Ag Ed in Colorado.

Conclusions

This study surveyed three different stakeholder groups of Ag Ed programs in Colorado: agriculture teachers, administrators, and community members. All three groups identified characteristics of six Ag Ed resources (Curriculum Design and Instruction, FFA and Leadership Development, SAE and Experiential Learning, the Agriculture Teacher, Program Management and Program Support) as to their perceived level of importance and implementation. Most statements were said to be characteristic of Colorado Ag Ed programs according to the perceptions of the participant groups. All three groups of participants viewed Colorado Ag Ed programs to be sustainable, and

there were no significant differences in the three groups of participants. All resources studied were positively correlated to sustainability, according to all participant responses. This would indicate that no one resource is important in sustainability of Ag Ed, rather, but rather that all resource should be considered collectively in pursuing a model of sustainability. This dissertation study was informative and provided data to be used in further analysis. Ag Ed in Colorado, according to the perceptions of the stakeholder groups, appears to be healthy and "holding its own." While each purpose of the study provided implications for further study, certainly SAE and Experiential Learning came to the forefront examining the findings of most purposes. SAE and Experiential Learning will be a primary focus of new research in Ag Ed in Colorado.

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APPENDIX A

Printed copy of electronic survey. A paper survey was also utilized for this study that was identical in questions but different in format.

Thank you for taking this survey!

I am writing to ask your help in a study of high school agricultural education programs in the state of Colorado. This study is part of an effort to determine the sustainability of these programs and to provide valuable information regarding growth of quality agricultural education programs.

You were selected to participate in this study because of your knowledge of agricultural education and the influence that you have regarding local programs. We are asking that primary administrators, teachers and a random sample of community advisory committee members complete this survey. We believe that having all three groups represented in the survey responses will provide differing and important viewpoints.

Results from this survey will be used to help leaders in Colorado agricultural education promote quality program growth. By understanding your perceptions of the aspects of agricultural education that make a local program sustainable, we hope to develop a format to promote additional programs.

There are known benefits for your participation in this study. It is a hope that the responses will develop a model of sustainability for secondary agricultural education programs in Colorado. This study will produce knowledge that will be informative to the local programs as to strategies for implementation of sustainable quality programs.

It is not possible to identify all potential risks in research procedures, but the researcher(s) have taken reasonable safeguards to minimize any known and potential, but unknown, risks. Your answers are completely confidential and data responses will only be reported as summaries in which no individual's answers can be identified. When you complete the web survey, SurveyMonkey will identify that you have completed the survey, but any identifiers that you see on the survey will be automatically deleted and your answers will never be connected to your name in any way.

This survey is voluntary. You may choose to stop answering this survey at any time. However, we very much would appreciate you taking approximately 15 minutes to complete the survey.

If you have any questions or comments about this study, I would be happy to talk with you. My office number is (970) 491-4277, or you can email me at kellie.enns@colostate.edu. If you have any questions about your rights as a volunteer in this research, contact Janell Barker, Human Research Administrator, at 970-491-1655.

Thank you very much for helping with this study and completing the enclosed survey. Your input is extremely valuable in this important research study.

Sincerely,

Jean Lehmann, Associate Dean for Research
College of Applied Human Sciences
Colorado State University

Kellie Enns, Instructor
Agricultural Education
Colorado State University

Section I: General Information

1. What is your primary role in regards to agricultural education in Colorado?

- ◯ Principal or School Administrator
- ◯ Agriculture Teacher
- ◯ Community or Advisory Committee Member

2. How long have you been affiliated with this school?

- ◯ First year
- ◯ 2-4 years
- ◯ 5-9 years
- ◯ 10-14 years
- ◯ 15-19 years
- ◯ 20 plus years

3. How long have you been employed as an agriculture teacher/administrator (community members please skip this question)?

- ◯ First Year
- ◯ 2-4 Years
- ◯ 5-9 Years
- ◯ 10-14 Years
- ◯ 15-19 Years
- ◯ 20 Years or More

4. The school district that I am affiliated with resides in a(n):

- ◯ Urban Area
- ◯ Suburban Area
- ◯ Town or Rural Area

5. The school district that I am affiliated with has a 9-12 (high school) enrollment of:

- ◯ 0-25 students
- ◯ 26-50 students
- ◯ 51-100 students
- ◯ 101-300 students
- ◯ 301-500 students
- ◯ 501-1000 students
- ◯ Over 1000 students
- ◯ Not Sure/Unable to Answer

6. How many students (unduplicated enrollment) are in the agricultural education program?

- ☐ 0-15 students
- ☐ 16-30 students
- ☐ 31-45 students
- ☐ 46-60 students
- ☐ 61-75 students
- ☐ 76-90 students
- ☐ 91-105 students
- ☐ Over 105 students
- ☐ Not Sure/Unable to Answer

7. Which FFA District is your school located in?

- ◯ Southeast
- ◯ South Platte
- ◯ Northeast
- ◯ Cache La Poudre
- ◯ Gunnison River Valley
- ◯ Colorado River Valley
- ◯ Southwest
- ◯ Arkansas Valley
- ◯ North Central
- ◯ High Plains
- ◯ San Isabel
- ◯ Not Sure/Unable to Answer

8. In your opinion, in the next five years the outlook for agriculture in the local area is:

- ◯ Very positive
- ◯ Positive
- ◯ Negative
- ◯ Very negative

9. There are viable opportunities for employment in agriculture in the next five years.

- ◯ Agree
- ◯ Disagree

10. The agriculture industry provides economic stability to the local economy.

- ◯ Agree
- ◯ Disagree

Section II: Organizational and Instructional Content of Ag Ed

In the next several sections of the survey you will be given a statement regarding Ag Ed. We want to examine your perceptions of the importance of these statements. We are also interested in discovering if these characteristic statements are implemented within the local program.

11. We are trying to understand the characteristics of this important component of Ag Ed. Please mark in one column to the right of the statement. There are no correct answers to these statements.

	Important and Locally Implemented	Important but NOT Locally Implemented	NOT Important but Locally Implemented	NOT Important and NOT Locally Implemented
Ag Ed notebooks are utilized	☐	☐	☐	☐
Ag Ed courses are in Ag I/Ag II/Ag III/IV format	☐	☐	☐	☐
Ag Ed courses are aligned along career pathways (such as Animal Science or Agribusiness)	☐	☐	☐	☐
Ag Ed is offered in both formats (Ag I/Ag II & pathways)	☐	☐	☐	☐
Leadership development (FFA) is integral to instructional delivery and is taught in the classroom	☐	☐	☐	☐
Students have an agriculture occupational objective (plan to be employed in agriculture)	☐	☐	☐	☐
Program design and content are based upon input from stakeholders (students, parents, advisory committee)	☐	☐	☐	☐
The program offers courses for college credit	☐	☐	☐	☐
Lesson plans are utilized and match approved course of study	☐	☐	☐	☐
Course content includes Agribusiness	☐	☐	☐	☐
Course content includes Environmental Sciences	☐	☐	☐	☐
Course content includes Animal Science	☐	☐	☐	☐
Course content includes Plant Science	☐	☐	☐	☐
Course content includes Natural Resources	☐	☐	☐	☐
Organization and Instructional Content Statements	☐	☐	☐	☐
Course content is delivered in Power,	☐	☐	☐	☐

Structure and Technical systems (mechanics)				
Course content is delivered in Food Science and Products	☐	☐	☐	☐
Students of all ability levels are enrolled in the program	☐	☐	☐	☐
Students with disabilities take courses in Ag Ed	☐	☐	☐	☐
Ag Ed courses receive academic credit (i.e. In science, math or speech)	☐	☐	☐	☐
The program reinforces important academic concepts	☐	☐	☐	☐
A school farm is available for instruction	☐	☐	☐	☐
A greenhouse is available for instruction	☐	☐	☐	☐
A shop or mechanics facility is available for instruction	☐	☐	☐	☐
Program is based on student interest	☐	☐	☐	☐
Instructional content is delivered in problem-based format (problems and solutions)	☐	☐	☐	☐
[illegible]	☐	☐	☐	☐

12. Rate the effectiveness of Organization and Instructional Content components utilized in the local program.

- ◯ Very Effective
- ◯ Effective
- ◯ Slightly Effective
- ◯ Slightly Ineffective
- ◯ Ineffective
- ◯ Very Ineffective

Section III: FFA and Leadership Development

13. We are trying to understand the characteristics of this important component of Ag Ed. Please mark in one column to the right of the statement. There are no correct answers to these statements.

	Important and Locally Implemented	Important but NOT Locally Implemented	NOT Important but Locally Implemented	NOT Important and NOT Locally Implemented
There is a local FFA chapter	☐	☐	☐	☐
All students in Ag Ed are FFA members	☐	☐	☐	☐
The chapter annually participates in State/National FFA activities	☐	☐	☐	☐
The local chapter participates in the National Chapter Awards program (completes the application) each year	☐	☐	☐	☐
Chapter conducts 10 local activities (or more) each year	☐	☐	☐	☐
The chapter conducts fun, well-planned, regularly scheduled meetings	☐	☐	☐	☐
The chapter develops a challenging program of activities	☐	☐	☐	☐
Members complete proficiency applications	☐	☐	☐	☐
FFA membership reflects the diversity of the school enrollment	☐	☐	☐	☐
The chapter has ample fund-raising activities	☐	☐	☐	☐
There is a local FFA banquet	☐	☐	☐	☐
Students are prepared for Career Development Events (also called judging contests)	☐	☐	☐	☐
The chapter elects and trains a capable officer team	☐	☐	☐	☐
FFA and Leadership Development Statements	☐	☐	☐	☐
The FFA participates in chapter traditions	☐	☐	☐	☐
The FFA Chapter conducts community service activities	☐	☐	☐	☐
The FFA uses a workable constitution and bylaws	☐	☐	☐	☐
FFA members apply and receive the Greenhand	☐	☐	☐	☐

FFA Degree				
FFA members apply and receive the Chapter FFA Degree	☐	☐	☐	☐
FFA members apply and receive the State FFA Degree	☐	☐	☐	☐
FFA members apply and receive the American FFA Degree	☐	☐	☐	☐
Members apply for award applications (proficiency, star awards, entrepreneurship, agriscience, etc.)	☐	☐	☐	☐

14. Rate the effectiveness of FFA and Leadership Development components utilized in the local program.

- ◯ Very Effective
- ◯ Effective
- ◯ Slightly Effective
- ◯ Slightly Ineffective
- ◯ Ineffective
- ◯ Very Ineffective

Section IV: Supervised Agricultural Experience (SAE) Programs and Experient...

SAE is supervised agricultural experience. SAEs are individual student projects relating to agriculture. An SAE can be a job, raising an agriculture enterprise, a research or community service project or running an agribusiness.

15. We are trying to understand the characteristics of this important component of Ag Ed. Please mark in one column to the right of the statement. There are no correct answers to these statements.

	Important and Locally Implemented	Important but NOT Locally Implemented	NOT Important but Locally Implemented	NOT Important and NOT Locally Implemented
Adequate evidence of SAE visits are maintained.	☐	☐	☐	☐
All students conduct viable and meaningful SAE programs	☐	☐	☐	☐
The instructor conducts one visit to students SAE yearly	☐	☐	☐	☐
The instructor conducts three visits to students SAE yearly	☐	☐	☐	☐
Class time is utilized to plan, coordinate, and update records related to the SAE	☐	☐	☐	☐
SAE and work-based learning are integrated into the curriculum	☐	☐	☐	☐
Students manage their own SAE	☐	☐	☐	☐
SAEs are linked to the curriculum and careers	☐	☐	☐	☐
Parents assist with SAEs	☐	☐	☐	☐
Students are recognized for their SAEs through local awards programs	☐	☐	☐	☐
SAEs are diverse (provide a variety of experiences for students)	☐	☐	☐	☐
SAEs are planned to meet the students occupational objective (career goals)	☐	☐	☐	☐
SAE and Experiential Learning Statements	☐	☐	☐	☐
School facilities are provided to meet the needs of students SAEs	☐	☐	☐	☐
Students enrolling in Ag Ed are visited before the first school year	☐	☐	☐	☐
Students have up to date records of their SAE	☐	☐	☐	☐
Students have a Long	☐	☐	☐	☐

Time Plan that allows for SAE expansion and further development				
Teacher provides adequate supervision for SAEs				
The students maintain records using a computer application				
The students SAEs are related to an agriculture pathway (i.e. animal systems, ag mechanical/technical systems, food systems)				
Student SAEs last over a period of 6 months				
Student SAEs extend over 360 hours yearly				

16. Rate the effectiveness of SAE and Experiential Learning components utilized in the local program.

- ◯ Very Effective
- ◯ Effective
- ◯ Slightly Effective
- ◯ Slightly Ineffective
- ◯ Ineffective
- ◯ Very Ineffective

Section V: Characteristics of Agriculture Teachers

17. We are trying to understand the characteristics of this important component of Ag Ed. Please mark in one column to the right of the statement.

Reminder: This is not intended to be evaluative of the local teacher. Results will be combined with ALL other results, and no teacher can be identified by this study.

	Important and Locally Implemented	Important but NOT Locally Implemented	NOT Important but Locally Implemented	NOT Important and NOT Locally Implemented
Advocates for student needs and cares for students	☐	☐	☐	☐
Assesses and evaluates student learning	☐	☐	☐	☐
Conducts meaningful Parent Teacher Conferences	☐	☐	☐	☐
Dedicates individual time to students	☐	☐	☐	☐
Employs a wide variety of teaching methods	☐	☐	☐	☐
Maintains adequate records of student progress	☐	☐	☐	☐
Manages student behavior	☐	☐	☐	☐
Motivates students to learn	☐	☐	☐	☐
Organizes and supervises teaching laboratories	☐	☐	☐	☐
Cleary defines expected behavior of students	☐	☐	☐	☐
Writes lesson plans	☐	☐	☐	☐
Continues training for an advanced degree (Master's Degree)	☐	☐	☐	☐
Has a full vocational credential in agriculture	☐	☐	☐	☐
Has a professional license from Colorado Department of Education in agriculture	☐	☐	☐	☐
Has a degree in Ag Ed	☐	☐	☐	☐
Has a degree in an agriculture-related field	☐	☐	☐	☐
Participates in local professional development	☐	☐	☐	☐
Participates in the Ag Ed Summer Conference (Ag Ed Professional development)	☐	☐	☐	☐
Joins professional organizations (Colorado	☐	☐	☐	☐

Vocational Agriculture Teachers Association (VATA)				
Develops strong relationships with school faculty, parents, agribusiness leaders, community leaders etc.	☐	☐	☐	☐
Presents a positive professional image	☐	☐	☐	☐
Lives within the school community	☐	☐	☐	☐
Participates in community functions	☐	☐	☐	☐
Participates in school activities outside of the ag program	☐	☐	☐	☐
Provides assistance to school personnel (other teachers and community members)	☐	☐	☐	☐
Works well with administrators	☐	☐	☐	☐

18. Rate the effectiveness of the characteristics of the agriculture teacher found in the local program.

- ◯ Very Effective
- ◯ Effective
- ◯ Slightly Effective
- ◯ Slightly Ineffective
- ◯ Ineffective
- ◯ Very Ineffective

Section VI: Program Management

19. We are trying to understand the characteristics of this important component of Ag Ed. Please mark in one column to the right of the statement. There are no correct answers to these statements.

	Important and Locally Implemented	Important but NOT Locally Implemented	NOT Important but Locally Implemented	NOT Important and NOT Locally Implemented
Has an active and well balanced advisory committee in place that conducts regular business meetings	☐	☐	☐	☐
Information is communicated to parents	☐	☐	☐	☐
Reports are completed for local and state administrators in a timely manner	☐	☐	☐	☐
An adult (Young Farmer) program is conducted	☐	☐	☐	☐
Program activities are based upon needs assessments or interest surveys	☐	☐	☐	☐
Maintains an appropriate annual program budget	☐	☐	☐	☐
Has implanted an effective public relations program	☐	☐	☐	☐
Embeds graduation standards in agriculture curriculum	☐	☐	☐	☐
Has well maintained classroom and laboratories (shops, farms, greenhouses, etc.)	☐	☐	☐	☐
Adequately manages tools, supplies and materials	☐	☐	☐	☐
Facilities and equipment meet all safety standards	☐	☐	☐	☐
Has an active FFA Alumni chapter	☐	☐	☐	☐
Provides guidance and assistance to students about post-secondary education options	☐	☐	☐	☐
Students are actively recruited to the program	☐	☐	☐	☐
Student enrollment in Ag Ed is similar to diversity of school enrollment	☐	☐	☐	☐
There is an adequate student to teacher ratio (enough teachers)	☐	☐	☐	☐

Enrollments in Ag Ed are strong

20. Rate the effectiveness of Program Management characteristics utilized in the local program.

- ◯ Very Effective
- ◯ Effective
- ◯ Slightly Effective
- ◯ Slightly Ineffective
- ◯ Ineffective
- ◯ Very Ineffective

Section VII: Program Support

21. We are trying to understand the characteristics of this important component of Ag Ed. Please mark in one column to the right of the statement. There are no correct answers to these statements.

	Important and Locally Implemented	Important but NOT Locally Implemented	NOT Important but Locally Implemented	NOT Important and NOT Locally Implemented
Program is able to raise adequate funds for FFA activities	☐	☐	☐	☐
Program manages budgets appropriately for district policies	☐	☐	☐	☐
Program has funding for necessary supplies	☐	☐	☐	☐
There is an adequate yearly budget	☐	☐	☐	☐
The program identifies potential partners in the community	☐	☐	☐	☐
Has a vehicle available solely to the program for student visits, travel and obtaining supplies	☐	☐	☐	☐
Instructor has a planning hour	☐	☐	☐	☐
Instructor has a release hour for SAEP visits and planning	☐	☐	☐	☐
Instructor has an extended contract for summer duties	☐	☐	☐	☐
Program has funds for capital purchases	☐	☐	☐	☐
Program has support of school administrators	☐	☐	☐	☐
Program has support of school board or local education agency	☐	☐	☐	☐
Program has community support	☐	☐	☐	☐
Volunteers contribute to the success of Ag Ed program	☐	☐	☐	☐
Program has support of faculty in the school outside of the Ag program	☐	☐	☐	☐
Contributors to the program are recognized	☐	☐	☐	☐

22. Rate the Program Support characteristics in the local program.

- ◯ Very High
- ◯ High
- ◯ Adequate
- ◯ Low
- ◯ Very Low

Section VIII: Sustainability

Sustainability: Agricultural education sustainability is the extent that a program is "endurable, livable, adaptable and supportable" (Akerland, 2000, p. 354). It is reflective of the local community and is dependant on the resources utilized within the program.

23. Please respond to the overall sustainability of the following components of Ag Ed

	Strongly Agree	Agree	Slightly Agree	Slightly Disagree	Disagree	Strongly Disagree
Organization and instructional design is essential to the overall sustainability of the local Ag Ed program.	○	○	○	○	○	○
FFA and leadership development is essential to the overall sustainability of the local Ag Ed program.	○	○	○	○	○	○
SAE and experiential learning is essential to the overall sustainability of the local Ag Ed program.	○	○	○	○	○	○
Agriculture instructors are essential to the overall sustainability of the local Ag Ed program.	○	○	○	○	○	○
Program management is essential to the overall sustainability of the local Ag Ed program.	○	○	○	○	○	○
Program support is essential to the overall sustainability of the local Ag Ed program.	○	○	○	○	○	○

24. Regarding sustainability:

	Strongly Agree	Agree	Slightly Agree	Slightly Disagree	Disagree	Strongly Disagree
The local program has longevity.	○	○	○	○	○	○
The local program is livable (can be implemented, a teacher can survive in it).	○	○	○	○	○	○
The local program is adaptable and changable.	○	○	○	○	○	○
The local program is supportable.	○	○	○	○	○	○

25. Please rank the degree of sustainability of your local agricultural education program where 10 is the highest level of sustainability and 1 is the lowest level of sustainability.

	10 (Sustainable)	9	8	7	6	5	4	3	2	1 (Not Sustainable)
Sustainability of Ag Ed Locally	○	○	○	○	○	○	○	○	○	○

26. From your perspective, what could strengthen the future of agricultural education sustainability?

27. From you perspective, what threatens the future of agricultural education sustainability?

Thank you for completing this survey. Your willingness to provide valuable information related to agricultural education will help us to develop new and improved agricultrual education programs! Thank you!

APPENDIX B

Notice of Approval for Human Research.

Colorado State University

Research Integrity & Compliance Review Office
Office of Vice President for Research
Fort Collins, CO 80523-2011
(970) 491-1553
FAX: (970) 491-2293

Notice of Approval for Human Research

Principal Investigator:	Jean Lehmann, Applied Human Sciences, 1501
Co-Principal Investigator:	Kellie Enns, Education, 1588
Title:	Colorado Secondary School Agricultural Education Programs: Perceptions of Sustainability
Protocol #:	07-312H **Funding Source:** N/A
Number of Participants/Records:	114 teachers; 100 administrators; 200 community members
Committee Action:	**Approval Date:** November 16, 2007 **Expires:** November 9, 2008
HRC Administrator:	Janell Barker

Consent Process:
Because of the nature of this research, it will not be necessary to obtain a signed consent form. However, all subjects must receive a copy of the approved electronic cover letters. The requirement of documentation of a consent form is waived under § ___.117(c)(2).

Investigator Responsibilities:

- It is the PI's responsibility to obtain consent from all subjects.
- It is the responsibility of the PI to immediately inform the Committee of any serious complications, unexpected risks, or injuries resulting from this research.
- It is also the PI's responsibility to notify the Committee of any changes in experimental design, participant population, consent procedures or documents. This can be done with a memo describing the changes and submitting any altered documents.
- Students serving as Co-Principal Investigators must obtain PI approval for any changes prior to submitting the proposed changes to the HRC for review and approval.
- The PI is ultimately responsible for the conduct of the project.
- A status report of this project will be required within a 12-month period from the date of review. Renewal is the PI's responsibility, but as a courtesy, a reminder will be sent approximately two months before the protocol expires. The PI will be asked to report on the numbers of subjects who have participated this year and project-to-date, problems encountered, and provide a verifying copy of the consent form or cover letter used. The necessary continuation form (H-101) is available from the RCO web page www.research.colostate.edu/rcoweb/.
- Upon completion of the project, an H-101 should be submitted as a close-out report.
- If approval did not accompany a proposal when it was submitted to a sponsor, it is the PI's responsibility to provide the sponsor with the approval notice. This approval is issued under Colorado State University's OHRP Federal Wide Assurance 00000647.
- **Should the protocol not be renewed before expiration, all activities must cease until the protocol has been re-reviewed.**

Please direct any questions about the Committee's action on this project to me for routing to the Committee. Additional information is available from the Regulatory Compliance web site at www.ricro.research.colostate.edu.

Date of Correspondence: 12/15/2007

APPENDIX C

Sample pre-notice letter, cover letter, and reminder postcard.

Colorado State University
School of Education
1588 Campus Delivery
Fort Collins, CO 80523-1588

November 26, 2006

Name
Address
Town, CO, zip

Dear Name,

Your name was provided to me by your local agricultural education teacher because of your involvement in the local Ag Ed program. We thank you for your commitment to this program!

A few days from now you will receive through the mail a request to complete a brief survey for an important research project being conducted at Colorado State University.

This survey will ask you to provide your perceptions regarding local agricultural education programs found in high schools in Colorado.

I am writing to you in advance because studies have shown that many people like to know ahead of time that they will be contacted. This study is an important one that will help us to determine the important aspects of agricultural education programs that make them sustainable. This study will provide valuable information that will help to create a model for growth and expansion of quality agricultural education programs.

Thank you for your time and consideration. It is only with the generous help of people like you that this research can be successful. Your input is very valuable to me and to Colorado State University.

Sincerely,

Jean Lehmann, Associate Dean for Research
College of Applied Human Sciences
Colorado State University

Kellie Enns, Instructor
Agricultural Education
Colorado State University

P.S. If you would prefer to take this survey in a web-based format, please feel free to call me at (970) 491-4277 and I will be happy to add your name to the web delivered format. You may also email me this information at kellie.enns@colostate.edu.

School of Education
1588 Campus Delivery
Fort Collins, CO 80523-1588

Dear Colleague of Agricultural Education:

I am writing to ask your help in a study of high school agricultural education programs in the state of Colorado. This study is part of an effort to determine the sustainability of these programs and to provide valuable information regarding growth of quality agricultural education programs.

You were selected to participate in this study because of your knowledge of agricultural education and the influence that you have on local programs. We are asking that primary administrators, teachers and a random sample of community advisory committee members complete this survey. We believe that having all three groups represented in the survey responses will provide differing and important viewpoints.

Results from this survey will be used to help leaders in Colorado agricultural education to promote quality program growth. By understanding your perceptions of the aspects of agricultural education that make a local program sustainable, we hope to develop a format to promote additional programs.

There are known benefits for your participation in this study. It is a hope that the responses will develop inform a model of sustainability for secondary agricultural education programs in Colorado. This study will produce knowledge that will be informative to local programs to develop strategies for implementation of sustainable quality programs.

It is not possible to identify all potential risks in research procedures, but the researcher(s) have taken reasonable safeguards to minimize any known and potential, but unknown, risks. Your answers are completely confidential and data responses will only be reported as summaries in which no individual's answers can be identified. When you return your completed questionnaire, the code that you see at the top of the survey will be deleted and your answers will never be connected to your name in any way.

This survey is voluntary. You may choose to stop answering this survey at any time. However, we very much would appreciate you taking approximately 20 minutes to complete the enclosed survey and returning it in the envelope that is enclosed. If for some reason you prefer to not respond, please let us know by returning the blank questionnaire in the enclosed envelope.

If you have any questions or comments about this study, I would be happy to talk with you. My office number is (970) 491-4277, or you can email me at kellie.enns@colostate.edu. If you have any questions about your rights as a volunteer in this research, contact Janell Barker, Human Research Administrator, at 970-491-1655.

Thank you very much for helping with this study and completing the enclosed survey. Your input is extremely valuable in this important research study.

Sincerely,

Jean Lehmann, Associate Dean for Research
College of Applied Human Sciences
Colorado State University

Kellie Enns, Instructor
Agricultural Education
Colorado State University

P.S. If you would prefer to take this survey through a web-based format, you may log onto www.coloradoffa.org and link to the Ag Ed Sustainability Study! Thank you.

Colleague in Ag Ed:

Over the last week a questionnaire seeking your input regarding agricultural education in Colorado was mailed, or emailed, to you. You have been asked to participate in this study because we feel that you have an important opinion regarding agricultural education that can help us improve and expand programs. **We are extending the deadline to return or complete the survey to Friday, December 21, 2007.**

If you have already completed and returned the questionnaire, please accept our sincere thanks and disregard this notice. If not, please take 15 minutes and complete the survey. We are especially grateful for your help because your insight into agricultural education is an important aspect to this study.

If you did not receive a survey, or if it was misplaced, please feel free to call me at (970) 491-4277 and I will gladly send you one in the mail today. You may also link to the online version of the survey by logging onto www.coloradoffa.org and following the link to the Agriculture Education Sustainability Survey (middle of page). You may also email me at kellie.enns@colostate.edu.

Sincerely,

Jean Lehmann, Associate Dean for Research
College of Applied Human Sciences
Colorado State University

Kellie Enns, Instructor
Agricultural Education
Colorado State University

APPENDIX D

Sample recruitment email to agriculture teaches asking for community contact information.

Greetings from CSU!

Many of you may know that I am trying to finish up my PhD this fall. In order to do so I have designed a research study under the direction and advice of my faculty advisor, Dr. Jean Lehmann who is the Associate Dean for Research in the College of Applied Human Sciences. This study pertains to the secondary programs of agricultural education in Colorado.

As such, I am asking for your help. About the third week of November I will begin collecting data on my dissertation project entitled "Colorado Secondary School Agricultural Education Programs: Perceptions of Sustainability." It is important to get opinions of this from you, your primary administrator and the community as well. So, could you please check the Ag Ed Directory and confirm that the contact information for you and your administrator are correct (I will typically use the Principal as the contact for this survey, unless you specify that I should go to the superintendent or vocational coordinator)? The survey should go to the administrator with the PRIMARY responsibility of supervision, hiring, funding of Ag Ed.

Next I am asking that you send to me a list of your advisory committee members and contact information (either email or mailing addresses). Only two from each of your lists will be asked to participate, but I need the full list to select from. If you currently do not have an active committee, someone who has previously served on your advisory committee or someone with great knowledge of the program would be sufficient.

I am trying to collect all names in the next week, so if you could take a minute and send this today I would appreciate it.

Thank you for your support of Colorado Agricultural Education

Kellie

Kellie.Enns@Colostate.Edu

(970) 491-4277