MICHIGAN AGRISCIENCE TEACHERS' PERCEPTIONS OF SUPERVISED AGRICULTURAL EXPERIENCE PROGRAMS

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ABSTRACT

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The purpose of this study was to determine Michigan agriscience teachers' perceptions of selected aspects of supervised agricultural experience programs. The study adopted the descriptive survey research method. Because the population of this study comprised all of the Michigan agriscience teachers (n=137) in high schools and vocational/career centers, a mailed questionnaire was thought to be the most appropriate technique for collecting the data of this study. Data were analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics -- frequencies, percentages, means, and standard deviations; and multiple regression were used in analyzing the data.

The study found that Michigan agriscience teachers supported the SAE concept in agriscience and rated SAE as a valuable component of today's agriscience program. They indicated that SAE programs help students solve problems, make decisions, attain self learning, and accept responsibility. The majority of teachers indicated that SAE programs were necessary for agriscience students. Thirty nine percent of the teachers indicated that their agriscience departments required that all students have SAE programs but only 55% of Michigan agriscience students were found to have SAE programs.

Teachers indicated that their departments provided several facilities for conducting SAE programs and some projects in which students initiate their SAE programs. Teachers said their schools did not provide them with vehicles for SAE visitation/supervision but compensated them for using their vehicles.

Fifty-seven percent of the teachers indicated that they would like to increase the emphasis on SAE programs, 37% were willing to maintain SAE programs, and 6% wanted to decrease the emphasis on SAE programs. Teachers indicated that they currently provided a small amount of assistance to students' SAE programs and thought they should increase this amount of assistance.

Finally, as a result of the multiple regression analysis, some demographic variables were identified as significant predictors of certain aspects of SAE programs. Female teachers were found to be significant negative predictors of the necessity of SAE programs. Also comprehensive high school, as the type of high school in which teachers worked, was a significant negative predictor of percentage of students having SAE. On the other hand, career center, as the type of high school in which teachers worked, was a significant positive predictor of benefits of SAE and factors affecting students' involvement with SAE. Further, teaching experience was a significant positive predictor of percentage of students having SAE. Scheduled time spent on teaching agriscience also was found to be likely a significant positive predictor of teachers' philosophies toward SAE and percentage of students having SAE programs.

To God for helping and giving me
the patience to accomplish this study

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CHAPTER I

INTRODUCTION

Background

Agriscience in public schools has a rich heritage of developing students' personal skills, as well as providing the abilities needed for agricultural employment. Students enrolled in agriscience have opportunities to apply the subject matter to real-life situations. Application of subject matter comes about through a deliberate program of experience conducted by the student and supervised by the teacher.

The ultimate purpose of teaching the various types of knowledge and skills in agricultural education is to help students use newly acquired knowledge and skills in meaningful ways. One of the best ways to ensure student understanding is to arrange for them to make use of knowledge and skills at the time learning occurs (Marzano, Pickering & Brandt, 1990). In-school and out-of-school experiences that focus on the use of knowledge and skills related to the instructional process represent a key component of the agricultural education program. The supervision and evaluation of experiential learning and the eventual recognition of students for excellence in experience make this aspect of agricultural education critical to the mission of the program and a cornerstone to the curriculum (Martin, 1991).

Experiential learning is a foundational philosophy integrated into every aspect of agricultural education. It is espoused by most agriculture educators throughout the United

States and around the world. It offers many practical applications that are used by agriculture educators, including laboratories, internships, and work-study (Steele, 1997). Experiential learning in agricultural education has long been recognized as an important part of the educational process. Through practice and experience, students apply what they have learned in real-life situations; thus, the material becomes understandable and usable. Moreover, as students gain experience, new problems and situations arise, causing learners to seek additional information and new ways of applying what they have learned (Cheek, Arrington, Carter, & Randell, 1994).

Agricultural education has a long and rich history of using an experiential education program component. Dating from the days of the Supervised Farming Programs to the current Supervised Experience Programs, two educationally sound principles have endured. Those two principles are the supervised nature of the program and the experiential nature of the program (Cox, 1991). The most common experiential learning element incorporated into the curriculum for agricultural education at the secondary level in the United States currently is termed the supervised agriculture experience (SAE) (Steele, 1997).

The concept of experiential learning through SAE programs has come a long way since the early 1900s. The Smith-Hughes Act of 1917 initiated federal support for vocational agriculture in public schools and specifically mandated that all students engage in a minimum of six months of supervised farming. For many years afterwards, teachers worked hard to develop and maintain SAE programs, which helped many young men and women become established in farming. Vocational agriculture teachers also have been employed to use opportunities to provide students with educational experience during the summer (Arrington & McCracken, 1983 & Croom 1991).

Several terms have been used to describe SAE programs, these include supervised farming program, experiential program, supervised farm practice, and supervised occupational experience (SOE) (Smith, 1982). Also, there are different types of SAE programs from which agriscience students can choose. Phipps and Osborne (1988) indicated that there are three major types of SAE programs. They are ownership, placement, and directed laboratory experience programs. They added that these programs have additional components, such as improvement projects, supplementary skills, and exploratory experiences.

SAE programs in agriscience incorporate experiential learning and direct application of knowledge into the student's curriculum to enhance learning. Martin (1991) indicated that SAE represents the ultimate goal of education in agriculture. Putting agricultural knowledge and skill to work in real situations is at the heart of agricultural education. Through a successful SAE program, students develop personal responsibility, self-confidence, self-esteem, job satisfaction, human relations skills, and basic citizenship and cooperation. In addition, students learn skills of time and money management, record keeping, entrepreneurship, and related job skills. SAE is a vital part of the agricultural education program. It meets the goals and objectives of both the local school district and the agricultural education program. Phipps and Osborne (1988) stated:

> Comprehensive SOE programs involving a number of activities may and should lead toward progressive establishment in occupations requiring knowledge and skills in agriculture. Through a program of supervised occupational experiences, students have an opportunity to accumulate cash savings and other capital assets. It is the responsibility of the agriculture teacher to motivate students to develop their programs to the extent that they will be challenging to them and will assist them in becoming established in an occupation. (p. 315-316)

> Supervised occupational experience programs are a very important part of any vocational agriculture program. Every effort should be made by instructors to

> promote SOE programs. They are exceedingly beneficial to high school students, as well as to a community. (P. 316)

Generally, the teacher is active in experiential learning in a variety of ways. One must become a better questioner to help students think at higher cognitive levels as they reflect on a given experience. In addition, the teacher is more a facilitator than an expert transmitter of knowledge. The teacher nurtures the student through talking *with* the student rather than talking *at* the student. The teacher also must be able to identify where the student is in the experiential learning process, in order to know what kinds of questions to ask. This helps the teacher know when and how to intervene when the student needs help through a particular stage. The teacher must also be a systematic planner. The experiential process does not leave the student without direction. Prior planning must take into account the learning outcomes, the learning settings, questions to be asked, and potential problems that might arise to prevent the student from reaching his or her conclusions as a result of reflecting on the experience (Grady, 1990).

Agricultural education teachers have a real challenge to reflect the changes in agriculture as they coordinate SAE programs to address the needs and interests of today's students within classroom instruction. Today's agricultural education students come from diverse backgrounds. Many students will have had little or no agricultural experience when they enter the program and little or no opportunity at home to develop a traditional SAE program (Elliot, Boone, & Doerfert, 1991). So the key to successful use of SAE programs is for the agriscience teacher to find opportunities that enhance students' agriscience experiences by allowing students to put into practice the theories they have learned in the classroom.

The teacher plays a substantial role by providing students with information and guidance conducive to determining the type of program that is best suited to the objectives the students have set for themselves. The teacher works with the students and their parents in setting up the program by actively making his or her experience and expertise available for securing necessary funds, facilities, and/or services (Smith, 1982).

To make progress in developing quality SAE programs, agricultural education teachers need to develop cooperative relations, provide excellent instruction, and have a sound visitation/supervision program (Case, 1984). Moreover, teachers should achieve balance among these components, especially SAE supervision/visitation, which requires time, equipment, and advanced arrangements in order to be successfully conducted. Nelson and Cooper (1984) stated that:

> An important part of the teacher's task in conducting SAE supervision is to assure that sufficient time and resources be available for this instructional activity. The justification of this support can be made easier by preparing an annual report of the student SAE accomplishments for the year. It is suggested that such a report be circulated among administrators, board members and parents, as well as the advisory committee. The report should include a summary of the scope of student activities (i.e., number of livestock, acres of grain, hours of work, net income, salary earned, etc.). It is astounding to many in the community to discover the significant economic contribution that results from instructional activities of the vocational agriculture teacher. (p. 14)

Several studies have been conducted to determine the perceptions and attitudes of agriscience teachers toward SAE programs. Most of these studies have indicated that the agriscience teacher is the most important of the ingredients necessary to successful SAE programs. Arrington and Price (1983), Berkey and Sutphin (1984), and Osborne (1988), found that vocational agriculture teachers generally supported the concept of SAE. Bobbitt

(1986) reported that vocational agriculture teachers in the United States thought that SAE programs were more important today than in the past.

Statement of the Problem

SAE programs are designed to help students plan, budget, make decisions, solve problems, evaluate activities, earn awards, and keep accurate records. Moreover, SAE programs provide the valuable occupational experiences that make education relevant (Elliot et al., 1991). The extent to which SAE programs can provide these benefits is affected by such factors as funding, teacher help and guidance, parent help, community influence, student backgrounds, and teacher and student expectations of the program.

Most of above-mentioned factors affect the success of SAE programs and need to be investigated. Because there are several differences among programs and changes have taken place in these programs, it would not be rational to investigate all of the factors affecting SAE programs in one study. However, a great deal remains to be discovered about teachers and students, who are the usual subjects of educational research (Borg, 1989). Also, according to the literature, the most influential factor affecting SAE programs is the agriscience teacher. For those two reasons, it seemed logical to undertake a study to determine Michigan agriscience teachers' perceptions of SAE programs.

Purpose of The Study

The primary purpose of this study was to determine the Michigan agriscience teachers' perceptions of selected aspects of SAE programs in Michigan high schools and vocational/career centers. These aspects included (a) teachers' philosophies regarding SAE, (b) teachers' perceptions of the benefits of SAE, (c) teachers' perceptions of factors affecting

students' involvement with SAE, (d) teachers' perceptions of the necessity of SAE, (e) teachers' perceptions of their agriscience7 departments' policies with regard to SAE, (f) teachers' perceptions of their departments' functions with regard to SAE, (g) teachers' perceptions of SAE visitation/supervision, (h) teachers' emphasis on student involvement with SAE in the future, (i) teachers' perceptions of amount of assistance currently provided and should be provided to their students' SAE programs. It was also investigated whether certain demographic characteristics of Michigan agriscience teachers could be identified as predictors of some of the above aspects of SAE programs.

Research Questions

To attain the primary purpose of this study, the following research questions were posed:

8. What are Michigan agriscience teachers' philosophies regarding SAE programs?
2. What do Michigan agriscience teachers view as the benefits of SAE programs?
3. What factors do Michigan agriscience teachers think affect students' involvement with SAE programs?
4. Do Michigan agriscience teachers believe that SAE programs are necessary for agriscience students?
5. What do Michigan agriscience teachers perceive to be their agriscience departments' policies with regard to SAE programs?
6. What do Michigan agriscience teachers perceive to be their agriscience departments' functions toward SAE programs?

7. How much out-of-class work time do Michigan agriscience teachers spend supervising students' SAE prog8rams?
8. How much time do Michigan agriscience teachers spend per visit in SAE visitation/supervision?
9. To what degree will Michigan agriscience teachers emphasize students' involvement with SAE programs in the future?
10. How much assistance do Michigan agriscience teachers provide to students' SAE programs?
11. How much assistance should be provided to students' SAE programs?

Five additional questions were posed to determine whether selected characteristics of Michigan agriscience teachers could be identified as predictors of certain aspects of SAE programs.

12 Can certain demographic characteristics of Michigan agriscience teachers be identified as predictors of teachers' philosophies regarding SAE programs?
13. Can certain demographic characteristics of Michigan agriscience teachers be identified as predictors of teachers' perceptions of the benefits of SAE programs?
14. Can certain demographic characteristics of Michigan agriscience teachers be identified as predictors of factors affecting students' involvement with SAE programs?
15. Can certain demographic characteristics of Michigan agriscience teachers be identified as predictors of teachers' perceptions of the necessity of SAE programs?
16. Can certain demographic characteristics of Michigan agriscience teachers be identified as predictors of the percentage of students who have in SAE programs?

Need for the Study

The most successful teachers are thos11e who have clear perceptions of where their programs are going and have a broad range of choices concerning how to conduct their programs. Teachers' perceptions of their educational programs play a vital role in preparing for and carrying out those programs. SAE programs are and always have been designed to make agricultural education practical, meaningful, and relevant to students.

Agriscience teachers play a critical role in the success or failure of students' SAE programs. Therefor, they should have positive attitudes and perceptions regarding such programs. Arrington and Price (1983), Bell (1984), Bobbitt (1986), Case and Stewart (1985), Dunham (1983), Osborne (1988), French (1983), Harris (1983), Herren (1984), Mlozi (1983), Reneau and Roider (1986), Rhodes (1984), Smith (1982), and Wright (1989) investigated perceptions and attitudes of agriscience teachers regarding SAE programs. Most of these studies were conducted outside of Michigan, and no recent study has been conducted specifically on perceptions of Michigan agriscience teachers regarding SAE programs. Thus, there was a need to conduct a study to determine Michigan agriscience teacher's perceptions of SAE programs.

Assumptions of The Study

This study was conducted having the following assumptions:

1. It was assumed that all of the respondents engaged in agriscience programs.
2. It was assumed that all of the respondents understood their role as teachers of agriscience .

3. It was assumed that all of the agriscience teachers were acquainted with SAE programs.
4. It was assumed that the teachers' backgrounds affected their perceptions of SAE programs.
5. It was assumed that the instrument used to collect the data determined accurately the respondents' perceptions regarding SAE programs.
6. It was assumed that the agriscience teachers who participated in the study were willing to cooperate by accurately filling out and returning the survey questionnaire.

Limitations of The Study

This study was conducted to determine Michigan agriscience teachers' perceptions of SAE programs within the following limitations:

1. The study focused on agriscience teachers in Michigan high schools and vocational/career centers.
2. The findings of this study pertained only to the population of Michigan agriscience teachers described in this study.
3. The analysis of data was dependent on the perceptions addressed in the questionnaire developed for this study.

Definition of Terms

The following terms were defined in the context in which they were used in this study:

Supervised agricultural experience (SAE) program: The actual planned application of concepts and principles learned in agriscience. Students are supervised by agriscience teachers in cooperation with parents/guardians, employers, and other adults who assist them in

and achieving other educational goals. The purpose is to help students develop skills and abilities leading to a career (Barrick, Arrington, Heffernan, Hughes, & Moody, 1992).

Perception: The process by which an individual makes a differentiation in his or her perceptual field or calls to the front with a degree of clarity certain events over others. This process of differentiating events and relationships between or among events constitutes the field of personal meaning for the individual at a given time (Combs et al., cited in Krueger, 1994).

Agriscience program: A high school program offering courses designed to prepare students for careers in agricultural production and other fields related to agriculture.

Agriscience teacher: A certified instructor who teaches one or more of the following subjects at the secondary school level: production agriculture, horticulture, agricultural mechanics, and forestry and natural resources.

Summary and Overview

Chapter I contains the background of the problem, a statement of the problem, purpose of the study, research questions, need for the study, assumptions, limitations, and definition of key terms. In the background of the problem, importance of the agriscience program, experiential learning, SAE programs, and agriscience teacher role through SAE were emphasized.

Chapter II contains a review of literature pertinent to the study. The theoretical framework was explained, followed by writings on philosophy, history, and definition of SAE programs. The quality and importance of SAE programs are discussed next, followed by the types of SAE programs. Students and agriscience teachers' involvement with SAE programs is the subject of the fifth and sixth sections respectively.

The study design and methodology are explained in chapter III. The methodology is described first, and the research questions are restated. The study population is described, and development of the instrument is discussed. The data-collection and data-analysis techniques used in the study also are delineated.

The study findings are presented in chapter IV. Chapter V contains a summary of the study, a discussion of the findings regarding each research question, conclusions drawn from the findings, recommendations, and suggestions for further studies.

CHAPTER II

REVIEW OF LITERATURE

Introduction

This chapter includes a review of literature related to SAE programs. It is organized into six sections. The theoretical framework for the study is discussed in the first section. Philosophy, history, and definition of SAE programs are detailed in the second section. Next, the quality and importance of SAE programs are discussed. The types of SAE programs are explained in the fourth section. Then, students' involvement with SAE programs and agriscience teachers' involvement with such programs are discussed in sections five and six respectively.

Theoretical Framework for the Study

From a philosophical context, John Dewey and other educators have emphasized the importance of experience in education. Dewey (1916) stated, "an ounce of experience is better than a ton of theory simply because it is only in experience that any theory has a vital and verifiable significance" (P. 109).

Experiences generally occur to everyone and may be either positive or negative, planned or unplanned, depending on the circumstances. Both positive and negative experiences contribute to the development of an individual. In all probability, people learn as much from negative experiences as they do from positive experiences. Whether positive or

negative, experiences are an essential component of behavior modification of all individuals. They provide an opportunity for active participation in the events and activities that every individual encounters in life.

With respect to whether all experiences are educational or not, Dewey (1938) indicated that the belief that all genuine education comes about through experience does not mean that all experiences are genuinely or equally educative. For some people, experiences are miseducative; that is, they have the effect of arresting or distorting further growth. Only when the lessons of experience can be expressed as new ideas, when the lessons of experience can be drawn, articulated, and acted upon, will development have taken place (Whitham & Erdynast, 1982).

From an educational point of view, experiences of a positive nature are the ones usually planned and provided to students so that they may participate actively in events or activities (McCormick, Cox, & Miller, 1989). Therefore, experiences should be considered as a valuable teaching tool to help students develop knowledge, skills, and abilities. Dewey (1938) saw teachers as having a primary responsibility for shaping experiences that would fit learners and lead toward growth.

Most of the theoretical underpinnings for experiential learning articulated by agriculture educators are associated with the influence of John Dewey earlier in this century (Steele, 1997). Dewey (1916) explained that experience, especially learning by doing, is an important part of the educational process in vocational education. Experience provides relevance to the theoretical and cognitive material of the classroom. Agriculture educators responded by implementing SAE programs (Stimson, cited in Dyer & Osborne, 1996).

Experiential learning has long been recognized as being important to teaching and learning in agricultural education programs. Experiential learning in agricultural education has been provided through several means, including Future Farmers of America (FFA) activities, land laboratories, field trips, and SAE programs. According to Cheek and Arrington (1990),

> Supervised agricultural experience is one of the major methods used to provide experiential learning. SAE is defined as all of the agricultural, both occupational and non-occupational, activities outside of the class setting where students apply the knowledge, skills, and attitudes that have been learned in the instructional program and where supervision is provided by parents, teachers, and others. (p. 12)

McCormick et al. (1989) indicated that agricultural experiences are those learning experiences of an agricultural nature used by a student who desires to gain an understanding and application about agriculture in order to satisfy personal interests and needs. These experiences could involve:

> The production of agricultural commodities, including food, fiber, wood products, horticultural crops and other plant and animal products... also included is the financing, processing, marketing and distribution of agricultural products; farm production supply and service industries; health, nutrition and food consumption; the use and conservation of land and water resources; and related economic, sociological, political, environmental and cultural characteristics of the food and fiber system. (Committee on Agricultural Education in Secondary Schools, 1988)

Providing experience to students requires that education include, along with the theoretical ideas and problems, experiential situations in which students can practice and work. Dewey (1938) believed that textbook problems most often were not real problems to students and that school learning should be experientially active. He supported learning experiences in which learners are directly in touch with the realities being studied, rather than simply reading about, hearing about, or talking about these realities. When experiential learning techniques are used as contributors to the creation of a learning environment that maximizes learners' skills in learning from their own experience, the full potential for learning

can be realized (Kolb & Lewis, 1986). As Dewey (1938) stated "education, in order for it to accomplish its ends both for the individual learner and for society, must be based upon experience-which is always the actual life-experience of some individual." (p. 116) Newcomb, McCracken, and Warmbrod (1986) explained the following principles for learning, some of which are related to experience: "Learning is maximized when students "inquire into" rather than receive "instruction" subject matter." (p.37) and "students learn what they practice; continued practice is usually necessary for retention of that learning."(p. 39)

SAE programs represent an essential part of the secondary agricultural education program, which consists of three integral components: classroom instruction, SAE programs, and participation in FFA activities. SAE is the component that emphasizes the "learning by doing " theory. SAE gives students a chance to use the principles they have learned in class and apply them to real life situations (Randell, Arrington, & Cheek, 1993).

Philosophy, History, and Definition of SAE Programs

Philosophy of SAE Programs

Learning by doing is an educational principle that has directed agricultural education for more than 60 years. This principle has been applied through various experiential learning methods. SAE is one such method commonly used in agriscience to extend formal education to agribusiness, farms, and other sites of agricultural activity where students apply the skills they have already learned. They also develop new occupational skills under the supervision of parents, employers, teachers, and/or others (Williams, 1980).

Hughes (1992) indicated that SAE is congruent with the philosophy expressed by Phipps (1980) in the Hand Book on Agricultural Education in Public Schools and members

of the profession in The Strategic Plan for Agricultural Education (National Summit on Agricultural Education, 1989). According to Phipps (1988), agricultural education programs value a) pragmatism, b) experiential learning, c) the individual student, d) vocational guidance and counseling and e) community oriented programs. The mission statement detailed in the Strategic Plan indicated that agricultural education supports :a) providing instruction in and about agriculture, b) developing the whole person, c) advocating free enterprise and entrepreneurship, d) being a part of the total educational system, and e) using a proven education process including formal instruction, experiential learning, and leadership and personal development.

According to the above, it is apparent that the philosophy behind SAE is that it is a method of instruction that emphasize experiential education or learning by doing.

History of SAE Programs

Moore (1979) traced the roots of SAE to the late of nineteenth and early of twentieth centuries. He indicated that the names of SAE programs have changed over time, but that the theory behind the concept has remained essentially the same. A historical overview of SAE programs was given in Experiencing Agriculture: A Handbook on Supervised Agricultural Experience (Barrick et al., 1992) as follows:

> The valuing of experiential learning is not new to agriculture. Although the name that represents the concept of supervised practice in vocational agricultural education has changed many times, the actual process of a formal supervised agricultural practice component can be traced to the early 1900s.
> Originally, supervised experiences were limited primarily to farming-related activities for boys. This was a time in our country's history when all agricultural students came from farms and ranches and were destined to return home when their schooling was completed.
> Generally referred to as "home projects,"experiential education usually took the form of a production enterprise such as livestock, poultry or crops. The purposes of these early home projects were:

a. to provide the student with an opportunity to develop through "real" supervised experience, the skills and knowledge required to conduct financially rewarding agricultural production enterprises;
b. to provide a demonstration of modern practice in agriculture to the community;
c. to provide a means for the vocational agriculture student to begin the establishment of a career in farming; and
d. to provide a basis for classroom instruction. (p. 1)

Herren (1986) stated that, at the turn of twentieth century, 80% of students dropped out of the school before reaching high school. The dropout rate soared to 91% before high school graduation. School programs of that time were described as impractical and boring. In 1908, Samuel Gompers, President of the American Federation of Labor, appointed a commission to study the educational situation. The commission recommended education for all young people and the opportunity to learn many technical skills.

Before 1908, the need for agricultural education was apparent in all states. An early trend in fulfilling this need was the establishment of dormitory schools. Early dormitory schools were costly to establish and maintain as they attempted to emulate the land-grant colleges of their time. The schools enrolled many students and provided a limited variety of farm activities. The students were dissatisfied with the lack of practical educational experiences these schools provided. After modifications were made in these schools, some beneficial results emerged and formed the basis of the "home-project" concept of vocational agriculture, which, afterwards, was known as the supervised occupational experience (SOE) program (Boone, 1987) or the SAE programs today. SAE programs have been a major part of the agriscience program since the passage of the Smith-Hughes Act in 1917. This act stated that "schools shall provide for directed or supervised practice in agriculture, either on a farm provided by the school or other farms, for at least six months per year." As a result of this

legislation and the belief that SAE programs were essential if the program was to be effective, SAE has been developed into an essential component of the agriscience curriculum. Also, an integral relationship has been developed among SAE programs, classroom instruction, laboratory practice and FFA activities (Cheek & Beeman, 1984).

SAE programs have changed since Stimson (1942) developed the concept. Terminology used in agricultural education literature and the proficiency awards offered by the FFA have affected these changes. The terms "supervised farming practice" or "farming practice" dominated the scene until 1963. The Vocational Education Act of 1963 guided educators to include nonfarm agricultural occupations in their curricula. This legislation, coupled with the realization that most students would not return to the farm, initiated the addition of "occupational experience" to the previously mentioned terms. Terminology changed frequently during the 1960s. In 1967, "supervised occupational experience " was selected as the appropriate term (Boone, Doerfert, and Elliot, 1987).

According to Doerfert, Elliot, and Boone (1989), SAE has been given the following names since 1908: Home Projects in 1908, Supervised Practice in 1928, Farming Programs in 1944, Farming Programs and Occupational Experience in 1963, Supervised Experience (including work experience) in 1966, Supervised Occupational Experience in 1967, Supervised Occupational Experience (SOE) Programs in 1979, and finally Supervised Agricultural Experience (SAE) programs since 1989.

It is apparent that experience is at the heart of most of the preceding concepts. Despite the changes in the name of the concept, supervised experience programs have remained and will continue to be an integral component of agriscience programs. The actual process is more important than the name assigned to it.

Definition of SAE

The concept of SAE has many different operational definitions, with obvious differences among states and regions of the United States. Some still equate SAE with Home Projects, and /or Supervised Farming Programs. Others have accepted the definition in a literal sense and use it to encompass ownership and placement experience, so long as the experience involves development of agricultural knowledge, skills, and/or attitudes with an occupational orientation. The difficulty with the broadened operational definition of SAE often has been that tradition and convenience were allowed to narrow the perception of what might be an acceptable supervised experience. Taken literally, the operational definition of SAE is limitless, so long as it involves some facet of agriscience and has an occupational orientation. Such a broad operational definition allows for adaptability and activity in developing an individually designed and planned supervised experience program (Zurbrick, 1989).

However, SAE has several more specific definitions, some of which are given below:

Barrick et al. (1992) defined SAE as:

> The actual, planned application of concepts and principles learned in agricultural education. Students are supervised by agriculture teachers in cooperation with parents/guardians, employers and other adults who assist them in the development and achievement of their educational goals. The purpose is to help students develop skills and abilities leading toward a career. (p.1)

Another comprehensive definition was given by Phipps and Osborne (1988):

> Supervised occupational experience (SOE) programs consist of all the practical agricultural activities of educational value conducted by students outside of class and laboratory instruction or on school released time for which systematic instruction and supervision are provided by their teachers, parents, employers, or others. (p. 313)

Lee (1984) defined SAE as an individually planned and continuous program to develop the competencies needed by students for occupation entry. Cheek and Beeman (1984) defined SAE as planned and practical activities conducted outside of regularly scheduled class time whereby students further develop and apply the knowledge, skills, and attitudes they have learned in the vocational agricultural program. Haward and Scanlon (1984) indicated that SAE is a method of instruction that emphasizes learning by doing.

The first two definitions given above are comprehensive ones. The first definition explained that SAE is a practical application of agriscience concepts and principles. It also explained who are actually responsible for conducting and supervising SAE programs and that a career is the goal for which students are prepared. Phipps, in his definition, added the educational nature of SAE programs and where and when SAE is applied.

In general, SAE is agricultural because it helps students prepare for agricultural occupations. Also, it involves experience or learning by doing because it allows students to apply practices and principles they have learned in the classroom and to develop new skills and abilities.

Quality and Importance of SAE Programs

A quality education is a birthright of every citizen. Some of the greatest educational controversies, however, have focused on the definition of "quality" and how to achieve it. For centuries, educators believed they had the answer: memorization and drill (Moore & Moore, 1984). Agriscience educators constantly are faced with new and more difficult challenges than ever before, as they seek to redefine and refocus their efforts in providing a solid educational experience that links the classroom with practical application and education

with industry. The most vital component of the agricultural education vehicle as it relates to providing young people with career opportunities and a chance to explore the industry is the SAE program (White, 1992).

Many educators throughout the United States have begun to question the quality and nature of the experiential component of vocational agriculture programs (Reneau & Roider, 1986). Quality SOE programs are those that provide students with the greatest opportunity for success by ensuring that the necessary prerequisites are there at the start. A poor-quality SOE project that is beyond the scope, resources, and abilities of students is no project at all. High-quality SOE projects have been, and should continue to be, the cornerstone of agricultural education programs (Howard & Scanlon, 1984).

Several studies have indicated that quality SAE programs encourage and motivate students (Boone et al., 1987). The National Research Council (1988) recognized the importance of SAE programs and identified several common characteristics of high-quality SAE programs. Such programs were characterized by involved teachers, planned experiences, adequate resources, and student placement in agribusiness and on commercial farms. Furthermore, the council recommended that a broader range of SAE programs be encouraged.

Quality and size of SAE programs have been found to be significantly and positively related to the length of teachers' contracts, the number of supervised visits made by teachers, the types of SAEs, conducted by students, travel funds available, teacher assistance with fairs (Arrington, 1981; Arrington & McCracken, 1983; Case & Stewart, 1985). They also significantly and positively related to parental support and encouragement, pupil-teacher ratio, career plans, the dependency of the family on farm income, availability of released time

(Gibson, 1988). Moreover, it was found that SAE quality significantly and positively related to the amount of time the teacher teaches agriculture courses, years of experience, teacher involvement in adult education programs (Straquadine, 1990), teacher priority given to SAE, and time devoted to SAEs (Warren & Flowers, 1992).

Case and Stewart (1985) concluded that the number of class hours spent on SOE instruction, as well as the use of SOE examples during instruction, improved SOE program quality. Likewise, Anyadoh and Barrick (1990) and Gibson (1988) reported that there was a positive relationship between SAE quality and the amount of classroom instruction on SAE programs.

Morton (1980) conducted a study to determine the relationship between the quality of SAE programs and achievement of students in agriscience. He explored the quality of SOE programs, measured in terms of student income, project scope, and level of achievement, using a multiple choice test designed to measure technical knowledge in production agriculture of high school students enrolled in production agriculture. Morton observed that there was a positive correlation between the quality scores of SOE programs and students' achievement test scores. Also, he observed a positive correlation between achievement test scores and opportunity to engage in SOE programs. These results led Morton to conclude that learning by doing is important for the successful education of agriscience students and that higher quality SAE programs are likely to result in greater achievement.

Research has indicated that often the agriscience teacher is at the root of the problem of poor quality or nonexistent supervised experiences. Perhaps the key to the problem is that teachers have never been exposed to the procedures involved in developing and conducting high-quality supervised experiences or that examples of contemporary supervised experiences

have not been developed (Boone, 1991). Dyer and Osborne (1996) reported that teachers may be the greatest determinants of SAE program quality but that demands on teachers' time affected SAE program quality. Harris and Newcomb (1985) found that teachers who provided high-quality SOE programs recognized the educational value of SOEs more than did those who provided low-quality SOEs. Teachers in multi-teacher programs were likely to place more emphasis on SOE programs (Harris & Newcomb, 1985). Gibson (1988) reported a negative relationship between the quality of SOE programs and the number of out-of-school activities (other than FFA) required by the teacher. Anyadoh and Barrick (1990) and Gibson (1988) also found a negative relationship between the distance the teacher lived from school and the quality of the SAE program.

Teacher expectations also affect the quality of SAE programs. Ingvalson (1983) reported that as teachers' expectations rose, so did their attitudes toward SAE programs. Dyer and Osborne (1996) reported that teachers' expectations strongly influenced SAE program quality. Teachers who participated in high school SAE programs were more likely to support and do a better job of administering those programs. Although the majority of teachers indicated such participation, the number of teachers with SAE experience may be decreasing. Teacher education institutions must become more active in providing beginning teachers with the background and knowledge needed to effectively administer SAE programs and to adapt experiential learning activities from SAEs to the classroom.

Several studies have found a relationship between the facilities provided for conducting SAE programs and the quality of such programs. Anyadoh and Barrick (1990) concluded that a significant positive relationship existed between availability of school facilities and the quality of SAE programs. Beeman (1967) reported that a majority of

agricultural education teachers and school administrators agreed that schools should provide land to agriculture programs for instructional use. Dyer and Osborne (1996) concluded that school-site lab facilities are essential if teachers are to provide quality SAE programs for today's students. Both teachers and administrators agreed that schools should provide SAE facilities. With an increasing number of students living in suburban and urban areas, the responsibility and opportunity to provide quality SAE projects is quickly shifting from program partners to the school. In planning for agricultural education programs, school systems should provide adequate lab facilities (both production and non production oriented) for students to conduct quality SAE programs.

The concept of SAE has stood the test of time and made a difference in the lives of many students. SAE programs, which are designed to meet the educational needs of the students, should continue to be an integral part of today's vocational agriculture programs. Vocational agriculture teachers must learn from past experience and provide opportunities for their students to gain concrete, real-life experiences in the many facets of the agricultural industry through quality SAE programs (Boone et al., 1987).

SAE programs apply the learning-by-doing principle which, is a proven method of instruction that has been used since the beginning of vocational education. Agriscience educators encourage SAE as an important component of agriscience programs.

> Most state plans, in the USA, for vocational education indicate all students enrolled in vocational agriculture will have supervised occupational experience as a part of their instruction program. (Amberson, 1967, p. 80)
> Supervised occupational experience programs are a very important part of any vocational agricultural program. Every effort should be made by instructors to promote supervised occupational experience programs. They are exceedingly beneficial to high school students, as well as a community. Having good supervised occupational experience programs is one of the best ways of giving agricultural education and teachers of agriculture favorable publicity and making agricultural

> courses a permanent part of a community's secondary school educational program. Supervised occupational experience programs are attractive, interesting, and educational to students, parents, and others. On the other hand, if teachers do not do an effective job with SOE programs, there may be much unfavorable criticism of the program of vocational education in agriculture. (Phipps & Osborne, 1988, p. 316)

Peterson and McGreight (1973) stressed the importance of SAE programs, asserting that SAE programs:

1. Are an extension of the classroom instruction for farm, ranch, or off-farm agricultural occupations.
2. Encourage the use of approved practices.
3. Promote closer cooperation and relationships between agribusiness and teachers.
4. Inform teachers about situations of students.
5. Make effective teaching in a real-life situation.
6. Help students see a need for relevant instruction.

The importance of SAE to secondary agriscience programs was evident in a study completed by McGhee and Cheek (1988). They found that ninth-and tenth-grade students who participated in SAE programs had significantly higher mean achievement test scores than students who indicated that they did not participate.

Williams (1977) conducted a study to determine the importance of SAE programs by agriscience students in production agriculture in Iowa. His results reflected differences according to the type of experience program conducted by the student: ownership, placement, or simulated. However, he found that ownership, placement, and simulated SAE programs were equally effective in developing skills that are important in agricultural occupations. The two highest rated occupational skills rated highest by all three SAE types were (a) the

importance of the honest work and (b) the development of acceptable personal and work habits.

Pelton (1985) found that agricultural education students in North Dakota perceived their SOE programs to be valuable. These students thought selected aspects of SAE programs were important. The students who lived on farm or ranch tended to perceive the aspects of SAE programs as being more important than did those who lived in a town, city, or rural area other than a farm.

Pals (1988) found that 749 vocational agriculture students in Idaho thought the five greatest benefits of SOE were:

1. Provided opportunity to learn on their own.
2. Promoted acceptance or responsibility.
3. Developed independence.
4. Developed pride in ownership.
5. Learned to appreciate work.

Wright (1989) conducted a study to assess the perceived importance of the economic impact of SAE programs in Oklahoma communities. He found that the teachers perceived leadership development, work habits, development of students' self-confidence, skill development, and record keeping as being "very important." Even though teachers rated SAE income as having of "some importance," they perceived the potential of losing SAE income from their communities as having a "high impact on local economics."

Supervised practice is helpful to students in many ways. It provides opportunities for them to work, earn money, achieve a degree of financial independence, and assume greater responsibility. Students in work experience programs perform under the supervision of a

teacher, employers, and parents in establishing desirable work habits. Students' abilities in cooperation, initiative, human resources, and flexibility also are developed. Supervised practice also enables students to develop specialized areas of experience that may not be available in the group setting of the classroom (McCracken, 1984). Williams (1979) found that SOE programs were beneficial to students, not only in the development of knowledge and skills, but also in the development of desirable occupational and educational attitudes and values.

SAE benefits not only agriscience students, but also those who are directly involved with the students in these programs such as teachers, parents, and employers. Hughes (1992) indicated that SAE programs are designed to provide numerous benefits to students, agriculture teachers, and others. SAE benefits agriculture teachers by (a) familiarizing them with new technologies and practices, (b) promoting positive school/community relations, (c) promoting parental involvement in the education process, (d) motivating students, and (e) keeping instruction relevant and practical. Pals and Slocombe (1989) assessed the benefits of SAE programs as perceived by students, parents, employers, and agriculture teachers. Students reported that the greatest benefits were the development of behavioral attitudes, values, and human relations skills. Parents, employers, and agriculture teachers also collectively identified the development of behavioral attitudes, values, and human relations skills as important benefits resulting from students participation in experience programs. Only employers perceived the opportunity to earn income while in school as one of the greatest five benefits.

Rawls (1982) found that parents of vocational agriculture students recognized the educational and occupational benefits derived from SOE programs and would generally

support educational programs if they could see the benefits provided to their sons and daughters. Rawls recommended that preservice and inservice agricultural education sessions should be initiated to design and implement programs that include parental involvement.

Kruckenberg and Williams (1980) studied employers participating in placement programs in Iowa. They found that (a) 100% of the employers thought the program was beneficial to their business and would employ students in the future, and (b) 60% of former placement-program students were employed in agricultural occupations and an additional 30% were continuing their education beyond high school.

In general, SAE can bridge the gap between school and work by providing opportunities for application and transfer of knowledge. Whereas classroom experiences enhance students' understanding of principles, genuine understanding and problem solving occur when students are faced with real problem situations that are solved only by application of principles. Then SAE programs make the instruction in an agricultural course practical and meaningful to the students. Thus, it is imperative that students understand the importance of different activities and how SAE programs fit into the total agriscience program.

Types of SAE Programs

Secondary agriscience programs have become more flexible by offering semester and trisemester courses. SAE programs need to be adapted to these flexible offerings (Pals, 1989). Because there are many different approaches, occupations, and student backgrounds and frequently there are no standard answers in organizing SAE programs, there are different opinions concerning types of SAE programs.

Peterson and McCracken (1973) stated that there are four primary types of supervised training: supervised farming or ranching, laboratory programs, farm placement, and supervised cooperative programs. Each of these types could also be coordinated with activities in home improvement and occupational skills development.

Key (1977) and Lee (1980) indicated that there are many types of SAE programs, but they can be categorized into a few groups. The first involves students owning and managing agricultural enterprises such as livestock, crops, or agribusiness. The students actively invest their own money, time, and labor in planning, directing, and marketing the product of their toil. Each phase of the operation is a joint effort involving not only the students but also their parents and the vocational agriculture teacher. The second method of providing SAE opportunities places students in agricultural operations that they do not own, although they perform many of the same duties as if they were owners. Under such a program, students may work in agribusinesses, on farms, or on facilities provided by the school. The last type of program is the simulated SOE. Here, students are provided the opportunity to use school facilities such as the classroom, shop, or laboratory to gain experience in performing tasks found in agricultural industries. Again, students are closely supervised and directed by the agriscience instructor.

In general, the most common types of SAE, are ownership and placement programs (Cheek & Beeman, 1984). McCracken (1984) added another type to these two types. He explained that supervised occupational experience programs can be one of three types, these are: ownership programs, placement programs, and improvement and skill projects. Phipps and Osborne (1988) identified three major types of SAE. These are ownership, placement, and directed laboratory experience. They added that there are some additional components

of SAE programs such as improvement projects, supplementary skills, and exploratory experience. However, the major types and additional components of SAE programs are discussed in the following paragraphs:

1. Ownership: The SOE ownership program is the oldest and most traditional type of SOE. It involves students having personal ownership, either complete or partial, of materials and other inputs required for an enterprise (Cheek & Beeman, 1984). Ownership programs can provide excellent opportunities for students to make decisions and apply instruction. Students are involved financially and own all or a portion of the enterprise or business. Amberson 1967) stated: "The ownership program's basic values are that it gives students pride of ownership and helps them appreciate the need for management experience. By taking part in ownership programs, students may grow into entrepreneurs" (p. 81).

SOE ownership programs often include individually owned productive enterprises, such as livestock, field crops, vegetables, fruits, bedding plants and so forth. Group productive enterprises, in which the enterprise is owned and managed by a group of students rather than an individual, are also a type of ownership program. Finally, non-farm entrepreneurship projects are another type of SAE ownership program. In this case, a student or a group of students owns and manages an agribusiness for a profit.

In general, ownership programs can present considerable financial risks to students. Therefore, teachers need to provide direct supervision as students plan, initiate, and manage ownership SAE programs. These students often become established in agricultural occupations on a part-time or full-time basis as a result of their SAE programs (Phipps & Osborne, 1988).

SAE ownership programs always have been changed and developed consistent with the changes that have taken place in agriscience programs and the agricultural industry.

> Traditionally, agricultural education programs consisted of ownership agricultural experience programs in livestock and crop production. Today, with expansion of the agricultural industry and declining number of farmers and ranchers, the nature of entrepreneurship programs has changed. Entrepreneurship SAEs can be developed not only in production agriculture, but in agricultural sales and service, forestry, marketing, agricultural mechanics, agricultural processing and other areas. (Barrick et al., 1992, p. 29)

> Although the ownership SOE program is generally associated with production agriculture, the idea is equally applicable in the other taxonomy areas in agribusiness. Students are currently using ownership SOE program concepts successfully in horticulture, mechanics, production agriculture, and forestry. (Amberson, 1967, p. 81)

SAE ownership programs also play a vital role in helping students gain employment in an agricultural field. Mick (1983) found that high school vocational agriculture programs were doing a better job of preparing students with farm backgrounds and ownership types of SOEs for employment in agricultural occupations than were other programs.

2. Placement: A second major type of SAE programs, according to Phipps and Osborne (1988) is the SAE placement program. They wrote:

> In this type, students earn and manage wages and have opportunities to extend and apply current agricultural knowledge and skills. They may be placed in agricultural production settings or in agricultural business and industry. SOE placement programs have grown to become a very important and appropriate type of SOE program for agriculture students. (p. 318)

Although the SAE placement program was indicated as the second major type of SAE program, Amberson (1967) stated:

> Placement program in production/agribusiness is not a second choice to ownership. Rather, for many students it is a more appropriate means for employment in an agriculture/agribusiness occupation. Initially, a placement program can provide career exploration in the field in which a student feels he/she has an interest. Even for students with a career goal of self-employment, placement is often the most feasible

> way to gain experience, due to an initial lack of capital or opportunity to pursue ownership SOE programs. (p. 81)

Barrick et al. (1992) commented:

> Placement programs involve the placement of students on farms and ranches, in agricultural businesses, in school laboratories, or in community facilities to provide a "learning by doing" atmosphere. Ideally, this atmosphere will enable students to develop competencies that permit entry and/or advancement in their chosen occupational field. Placement programs may be conducted in any of the instructional areas under the umbrella of agricultural education. Usually, they will be conducted "outside of the classroom instruction" time. (p. 33)

So, through SAE placement programs, students work for others on a farm, in school laboratories beyond regular class time, or in the community for pay or only for experience. Doerfert (1992) indicated that the purpose of SAE placement programs is for students to gain practical experiences needed to alter or advance in their chosen occupational field. These students use facilities and other resources provided by employers, schools or community organizations to develop essential employment competencies.

Cooper (1984) indicated that placement programs have the following strengths:

1. Close student supervision
2. High levels of project quality.
3. Immediate feedback on business decisions.
4. Monetary returns for the school agriculture program.
5. Monetary returns for the student.
6. Clear and immediate evidence to school officials that the program is preparing students for wage earning and job entry.
7. Practical experience with business machines.
8. Practical experience with business methods such as advertising publicity.

SAE placement programs are one vehicle teachers can use to provide agriscience students with experience in an array of agricultural occupations. Before students participate in these programs, however, Slocombe (1984) recommended that they need to learn the what, why, and how of SOE placement programs. Further, he said that teachers must provide group instruction that will help students identify the opportunities that are important to them and prepare plans for becoming involved. Vocational activities also should be included in all SOE placement programs. Agricultural and natural resources students who select a placement type of program can choose between paid and unpaid experience programs. For financial reasons, most students will select a paid experience program. However, students should be advised that selecting an experience program solely on the basis of monetary returns might not be the best decision.

Placement projects demand flexibility in meeting the needs of today's agriscience students. Because there is a choice involved in placement programs, agriscience teachers should help students select and develop an SAE placement program related to their occupational objectives. To prepare students effectively for these programs, teachers must have the content and the procedures to do the job.

3. Directed laboratory experience: The third major type of SAE program, according to Phipps and Osborne (1988), is the directed laboratory experience. They wrote:

> Students with this SOE program are placed in school-owned or community facilities at a time other than during regular school hours. Directed laboratory experience often provides concentrated skill development and strengthens the connection between instruction and SAE. Greenhouses and laboratories such as arboretums, field crops, and animal laboratories, nurseries, woodlots, turfgrass plots, ponds, and vegetable plots, provide excellent settings for SOE directed laboratory experience programs. The key to worthwhile directed laboratory experience is planning and supervision by the teacher. Directed laboratory experience activities must go beyond the learning experiences provided in regular classroom and laboratory instruction. Directed

> laboratory experience as a SOE program is the most appropriate and beneficial to students with limited opportunities for SOE programs involving ownership and placement. (p. 318)

The agriculture profession has, from its inception, used laboratories in the school and community as vehicles for implementing the principle of learning by doing. Traditionally, agriculture teachers have used laboratories for student practice as the application stage of in-class instruction. Laboratory use for SOE programs has not been as popular a practice among teachers in the past. Nevertheless, laboratories, whether they are used for in-class instruction or SOE, enhance the teaching and learning process and develop competencies needed for placement in agricultural careers. The best use of laboratories occurs when they closely replicate the agricultural work place in terms of equipment, design and operation (Sutphin, 1984).

SAE laboratory programs are the opportunity many young people with a keen interest in agriculture are searching for in their secondary vocational education training (Pearson, 1984). A land laboratory is an ideal location for providing supervised experiences for students and teachers because it has the facilities and land necessary to meet the basic requirements of many agricultural activities and it is easily accessible (Cheek & Arrington, 1984).

There is evidence that land laboratories are providing opportunities for students to develop SAE programs. Leising, Wolfram, and Zilbert (1982) found that 18.7% of the vocational agriculture students in California were using the greenhouse for SAE projects, 18.9% of the students were using the land laboratory for land projects, and 16% of the students were using the school barn for projects. Arrington (1983) found that almost one-fourth of the 1983 vocational agriculture graduates had conducted SAE activities on the school land laboratory facilities.

4. Additional components: Phipps and Osborne (1988) stated, "no SOE program is complete until improvement projects and supplementary skills have been incorporated into it. These phases of SAE provide further opportunities for development and transfer of agricultural skills and help "roundout" the SOE program" (p. 319). McCracken (1984) indicated that improvement and skill development projects may be used as SOEs. These additional components are described below:

Improvement projects: These projects involve a series of related activities requiring a relatively long time to complete. Improvement projects are undertaken to increase the value and/or appearance of a home or production and business setting. Improvement projects also are aimed at improving agricultural practices or upgrading environmental conditions so that production efficiency is increased. Newcomb et al. (1986) stated:

> Improvement projects may be developed by students to improve the efficiency of an enterprise or an entire business, the appearance or real-estate value of the farm or place of business, or the appearance, value, comfort, and convenience of the student. This type of project is usually financed by parents or an employer with no degree of ownership by the student. Some examples are:
> -Garden improvement.
> -Lawn improvement.
> -Home landscaping improvement.
> -Home shop improvement.
> -Nature trail development.
> -Sheep enterprise improvement.
> -Home painting.
> -Home library development.
> -Business product display improvement.
>
> Similar improvement projects can be used by most students in applying instruction. For example, following a unit of gardening, students could be encouraged to apply the instruction by having an improvement project on gardening. (p. 229, 230)

With respect to the relationship between improvement activities and the other SAE programs, Barrick et al. (1992) wrote:

> Improvement activities do not replace exploratory, entrepreneurship, or placement SAE. Instead, they complement the Supervised Agricultural Experience and help build citizenship. Improvement activities are a part of all SAE programs and are included in the program plans. Improvement activities are generally classified activities that have a large scope and may involve a series of jobs or activities. These activities may or may not have a set time for completion but are generally considered to be in effect for the duration of the particular course of study to which they are related. (Experiencing Agriculture, 1992 p. 29)

Supplementary skills: These activities are performed for the purpose of developing skills unrelated to the student's SOE ownership, placement, directed laboratory experience, or improvement projects. In contrast to improvement projects, supplementary skills consist of single jobs or activities. Supplementary skills should be a part of every student's SAE program because they provide experiences that broaden skill development and application of approved practices.

> Supplementary projects are done by students to learn specific skills. They enable students to broaden their experiences beyond ownership, placement, and improvement projects. The skills or competencies, are usually performed to learn tasks needed for agricultural occupations. (Newcomb et al., 1986, p. 230)

Exploratory experience: An important ingredient of SOE programs for all students studying agriculture, regardless of their career goals, is exploratory experience. An exploratory experience is a study visit with workers in production agriculture, ornamental horticulture, forestry, conservation, agricultural services, agricultural processing, agricultural mechanics, or professional agriculture (Phipps & Osborne, 1988). Barrick et al. (1992) stated that exploratory SAE programs provide opportunities for students to develop an awareness and further understanding of careers in agriculture or to increase their awareness and understanding of the food and fiber system.

Two types of exploratory SAE programs are career exploration and agricultural literacy. Career exploration is designed to increase students' awareness of agricultural careers.

Agricultural literacy is designed to develop students' agricultural literacy and thus emphasizes increased knowledge about agriculture. Agricultural literacy programs comprise of a series of experiential learning activities designed to accomplish one or more of the following five objectives (Barrick et al, 1992):

1. Developing an understanding of ethical and environmental issues related to agriculture.
2. Developing the ability to grow and care for plants and animals.
3. Developing an understanding of the relationship between agriculture and diet.
4. Developing an appreciation of national and international economic and trade systems.
5. Developing an understanding of issues relating to agricultural policy of the federal government.

From the preceding discussion, it is apparent that there are several types of SAE programs from which students can select, but the key to successful selection is the agriscience teacher. Agriscience teachers must be creative and flexible when helping students select and conduct their SAE programs. Also, the SAE should not viewed as requirement for class credit, but rather as an opportunity for students to maximize their learning and opportunity for placement and advancement in an agricultural occupation.

Students' Involvement and Participation with SAE Programs

Students tend to learn more and better when they are actively involved in the learning process. Active participation is essential for learning, especially in experiential and practical programs. As McCormick et al. (1989) stated, "Active participation on the part of students

helps to reduce abstractness in learning new knowledge, skills, and attitudes. SAE should be considered as a valuable teaching tool to help students develop knowledge, skills, and attitudes" (p. 10).

Considering students' needs and interests is essential in helping them be involved in experiential and real life situations.

> The actual degree of involvement in agricultural practice can vary from casual observation all the way to actual "hands-on" participation. The scope of agricultural experiences should depend , to a large extent, on students' needs, interests, and career goals. Supervised agricultural experience would be the most appropriate for students involved in educational programs about agriculture. (McCormick et al., 1989, p. 10)

SAE programs systematically involve students in real-life agricultural experiences that are planned and supervised as a part of the agriscience program. Several studies have concluded that there was a relationship between students' participation and involvement in SAE and their acquiring knowledge and other values. Cheek et al. (1994) found that there was a moderate correlation between students' participation in SAE and their academic achievement. However, such participation was not significant in explaining a significant portion of the variance in student achievement. Arrington and Cheek (1990) concluded that there was a significant positive relationship between the scope of SAE and academic achievement for students in the tenth grade, but not for those in the ninth grade.

Morris and Williams (1984) found that students who participated in animal/crop ownership SOE programs scored significantly lower on self-image than those who had not had such experience. This finding may be partially explained by the amount of responsibility associated with ownership SOE programs, especially in the early stages. Rewards from animal/crop ownership may be more long-term in nature. Morris and Williams also found also that students who had SOE programs that featured farm employment away from the home

had higher self-esteem than those who did not have such experience. They added that employment can provide immediate rewards that are highly observable to students. Such rewards can make individuals feel good about what they are doing and about themselves.

Lee (1984) investigated the relationship between student's perceived skill development and characteristics of SOE programs. The findings indicated that there were differences between students' perceived level of skill proficiency with regard to livestock types that were part of the SOE program and their proficiency for other livestock types. Students who had various types of livestock as part of the SOE program rated their level of skill proficiency significantly higher for those types than for other types of livestock.

Slocombe (1983) found significantly higher knowledge scores were achieved by: (a) students living on a farm than those living in a city or town, (b) students with production SOE programs than those with on-farm SOE placement programs, (c) students with occupational aspirations in production agriculture than those who were undecided about their occupational aspirations, and (d) students who planned to continue their formal education than those who did not. Also, he found that students who desired employment experience in production agriculture had a more positive attitude toward placement programs than did those who were interested in agricultural processing. Students with off-farm SOE programs achieved significantly higher program planning scores than did those without SOE programs.

Students' involvement and participation in SAE programs were affected by several factors. Sutphin (1984) reported that (a) the diversity of student agricultural occupational interests, (b) the increasing number of students from urban and suburban backgrounds, (c) the decline in the number of farms, and (d) the tight economy were some of the barriers to involving every vocational agriculture student in an SOE program.

Gebhardt (1985) found that (a) teacher commitment to supervised occupational experience programs, (b) community understanding of FFA and SOE programs, (c) local program with an extended contract for on-site instruction, and (d) parent/guardian or employer support of agricultural education were the most important factors associated with students' participation in SAE programs. He also found that (a) teacher success with SOE programs before entering teaching, (b) size of community, (c) other vocational/mechanical course offerings in school, and (d) parent's/guardian's or employer's previous vocational agriculture experience were the least important factors associated with students' participation in SOE programs.

Foster (1984) conducted a study to identify factors limiting students' participation in SAE programs in Nebraska, as perceived by vocational agriculture instructors in the state. He found that the 10 highest rated factors identified as limiting participation in SOE were:

- Students dislike maintaining SOE program records.
- Students' participation in sports is excessive.
- Current loan interest rates are too high.
- Money available for students to finance SOE is limited.
- Agribusinesses are hiring fewer student learners.
- Parents' ability to help with financing is limited.
- Agribusinesses needed for placement in the community are limited.
- No facilities are available for non traditional SOE programs.
- Students' participation in activities other than sports is excessive
- No school land-laboratory is available.

On the other hand, the researcher found that the five factors having the least effect on limiting students' participation in SOE were:

- The local education association discourages after school activity.
- The vocational agriculture instructor has had limited teaching experience.
- Community members' attitudes about vocational agriculture are negative.
- Community members' attitudes about SOE programs are negative.
- Students from affluent families do not need the employment.

Dunham (1983) found that significant factors related to students' involvement in SOE programs included (a) times visited by the teacher, (b) activity in the FFA, (c) plans to enter an agricultural occupation, (d) population of the home area, (e) assistance from the teacher with SOE programs, (f) grade point average, and (g) occupation of parents.

Bell (1984) investigated students' involvement in SOE and FFA. He found that (a) the number of semesters, students were enrolled in vocational agriculture did not strongly affect their involvement in SOE programs, (b) the type of program in which students were enrolled affected their involvement in SOE and FFA, and (c) the instructors' perception of necessary program characteristics did not affect the extent of students' involvement in either SOE or FFA.

Students' involvement and participation in SOE have been found to vary from state to state. In Florida, Arrington and Price (1993) found that 68% of the agriculture students had undertaken an SOE program for one year out of four, but only 42% had contracted for four years. They also found that 24% of students had been involved in placement programs. In areas I and II in Texas, Harris and Newcomb (1985) found that 58% of the agricultural education departments had SOE programs. Dunham (1983) found that 80% of agricultural

education students in Utah had SOE programs in 1982. Berkey and Sutphin (1983) reported that one-fourth of the vocational agriculture programs in New York failed to have a written SAE program plan for students; half of these programs included freshman students in SOE programs; and of the students involved in placement programs, only 27% had accumulated more than 300 hours of experience. In North Carolina, Miller (1980) indicated that teachers estimated that only 58% of their students had SAE programs.

The number of students per class and their background can encourage teachers to have and supervise SAE for their students. Anderson (1983) found that teachers with more students per class were significantly more likely to have SOE programs than were teachers with fewer students per class. He also found that teachers with more students from rural and small town areas were significantly more likely to have SOE programs. Dunham (1983) found that about 54% of teachers reported conducting programs in which at least 75% of students participated in SAE programs.

Agriscience Teachers' Involvement With SAE Programs

Agriscience teachers' involvement is very intensive and far reaching in SAE programs because they play critical roles in promoting and managing successful student experiences. Agriscience teachers are responsible for guiding students in selecting, planning, and developing appropriate SAE programs, as well as supervising students on a regular basis. Hence, agriscience teachers should insist that SAE programs are well planned in terms of students' occupational goals. Further, teachers need to provide individual instruction specific to the agricultural experience. They also should provide regular supervision of students' SAE

programs, develop cooperative relationships, and have a sound visitation program in order to ensure students' progress in SAE programs.

Phipps and Osborne (1988) stated, "The success or failure of the supervised occupational experience programs is largely dependent on the efforts of the teacher of agriculture" (p. 322-323). Phipps and Osborne also described the responsibility of the teacher as follows:

1. Teacher should provide systematic instruction on SOE program.
2. Teacher should encourage high standards for the program.
3. Teacher should understand what is meant by a good SOE program.
4. Teacher should visit each program frequently and give helpful assistance to the student, the parents, and the employer.
5. Teacher should guide students in career planning.
6. Teacher should assist in identifying and developing SOE opportunities within the school and community. (p. 323)

Osborne and Reed (1984) indicated that, to be successful, vocational agriculture teachers must believe that SOE programs will give their students increased enthusiasm for a specific area of agriculture, better skills for practical application, and new learning or insight into that area of study. Osborne and Reed explained that, to attain this success, the teacher should perform five essential roles: planner, facilitator, supporter, evaluator, and diagnostician.

As a planner, the vocational agriculture teacher decides many things about the SAE program that will play an important part in its overall success. The SAE program should be positive and as close as possible to fail-safe, especially for the beginning student. To accomplish this, the time frame for each segment of the program should be small, perhaps quarterly, rather than yearly. To assist students in planning their SAE programs, the agriculture teachers need to provide systematic instruction throughout the school year

(Barrick et al., 1992). It is also helpful to consider the needs and interests of the students, the needs of the agricultural industry, and availability of resources when helping students plan their SAE programs (Barrick et al., 1992). As a facilitator, the teacher helps students recognize what they would like to accomplish and how. If the students are unable to identify a SAE project, particular projects should be not assigned. Instead, several ideas should be presented to them for their consideration. Also as a facilitator, the teacher must place the right student in the right spot, with the right equipment and supplies, and with the skills and knowledge to do the job well. As a supporter, the teacher provides encouragement and support. When students encounter problems with their SAE programs, they need to feel free to share those concerns with the teacher. The teacher as evaluator is also a familiar role. A thorough evaluation gives students some feedback for planning an expanded SAE program the following year. Involving students in the education process should be a part of the total SAE experience. The teacher as diagnostician is a professional at work-analyzing the needs, and weaknesses of particular students.

Osborne and Reed (1984) added that teachers who carry out the five functions of planning, facilitating, supporting, evaluating, and diagnosing will make SOE programs more than just a requirement. They will become a true extension of the class and the entire learning process and ensure the vocational nature of agricultural education programs.

The literature indicated that the most influential factor affecting SAE programs is the agriscience teacher. The literature further suggested that teacher activities affecting SAE programs can be classified into three categories: (a) developing cooperative relationships, (b) developing instruction, and (c) providing-on-site visitation/supervision.

1) Developing cooperative relationships: In developing cooperative relationships through SAE, the teacher might wish to employ some of the following activities (Case, 1984):

a. Seek advice from a local advisory council as to the need and opportunities for placement SOE programs for vocational agriculture students.

b. Secure support from the local school administration and board of education. This can be done by keeping the administration informed about all facets of vocational agriculture.

c. Secure the support of parents and employers by involving them in identifying competencies to be learned by students. This can be accomplished by developing a written agreement among the parents, the employer, the student, and the teacher that specifies competencies, activities, and responsibilities of those involved. In addition, group meetings should be held to inform parents and employers about SOE programs.

d. Develop a good public relations program. A good understanding of the SOE program by the general public is a necessity. Schools often are criticized because students are out of the classroom; the general thought is that students are not learning unless they are within the confines of a classroom.

e. Conduct frequent visits to students, parents, and employers. Visitation may be the most effective means of developing understanding and cooperation. The teacher is put in a positive role of providing needed advice and establishes rapport with the community. In this regard, Phipps and Osborne wrote, "Cooperative relationships among an instructor, the parents, the employers, and the student have a very important bearing upon the effectiveness of the instruction. They are basic to all teaching and must be secured" (p. 214).

2) Developing instruction: Classroom instruction is one of the major functions of the agriscience teacher. To motivate students and help them understand and develop SAE programs, organized instruction is essential. Instruction must be based on identified and validated agricultural competencies. Students must have a thorough understanding of the career opportunities available to them and how they can gather the necessary experience to secure the occupation of their choice (Case, 1984). The teacher must be organized and prepared each day in order to provide adequate classroom instruction. Technical information, combined with a knowledge of students' needs, is essential for relevant instruction.

3) Providing on-site visitation/supervision: On-site visitation provides the teacher with knowledge about the students' progress and problems. This information is useful in planning and conducting relevant classroom instruction, which, in turn, aids the development of quality SAE programs. Students, parents, and employers need to be involved in the visitation/supervision process. All need to have a thorough understanding of the purpose of visitation/supervision. Visits need to be carefully planned and skillfully conducted in order to maximize the educational benefits.

Swortzel (1996) reported that probably the greatest responsibility of agriscience teachers is supervision. MaCracken (1975) commented that the success or failure of SAE programs for students depends, to a large degree, on the effectiveness of supervision by the teacher. Although supervision is intended to provide individual instruction to students, it can also develop essential cooperative relationships with employers and parents/guardians (Barrick et al., 1992). Watkins (1981) reported that the majority of agricultural employers in her study believed that students benefitted from teacher visits to the work site. Harris (1983), Gibson (1987), and Anyadoh (1989) all reported positive relationships between the number

of supervisory visits and the quality of supervised experience programs. Without supervision, supervised experience programs would be like schools without teachers (McMillion & Auville, 1976).

Swortzel (1996) added that various researchers have concluded that proper and adequate supervision must occur for SAE programs to be successful. Osborne (1988) found that teacher involvement in planning and supervision was linked to the nature of supervised programs and student backgrounds. Students from farms with traditional programs were more likely than others to receive the needed assistance. Osborne also found that teachers on extended contracts were more heavily involved in planning and supervision strategies. Herren and Cole (1984) found that teachers should have at least one period for SOE-program supervision. Further, they noted that teachers should maintain accurate records on mileage, student progress, and recommendations, and that the teacher is only the person who can do an effective job of SAE program supervision.

Assisting students through their SAE programs is also an essential responsibility of the agriscience teacher. Slocomb (1984) stated, "The major responsibility for the vocational agriculture teacher is to assist students in selecting and developing supervised occupational experience programs" (p. 9).

Williams (1980) identified five ways teachers provide assistance to students in the SOE activity. They aid students by (a) assisting in record keeping on SOE programs, (b) providing encouragement for the SOE programs, (c) summarizing the records for the SOE programs, (d) learning skills in agriculture, and (e) setting educational goals in agriculture. Reneau and Roider (1986) stated that vocational agriculture teachers have played an important role in students' acceptance of and involvement with SOE programs.

Williams (1979) found that students perceived that they received more significant assistance from their parents than from teachers with 16 of 30 assistance items. These 16 items were related to development of interest in agriculture, providing resources for agricultural production projects, producing and marketing agricultural products, and making business management decisions. On the other hand, the same students perceived that they received significantly more assistance from teachers than their parents with 9 of 30 assistance items. These nine items were related to providing encouragement, keeping and using records, developing plans, setting goals for SOE, and evaluating SOE programs.

Teachers' attitudes and perceptions regarding SAE programs have been found to have a positive influence on the quality of SAE programs. Several studies have been conducted to determine the attitudes and perceptions of agriscience teachers regarding SAE programs. Reneau and Roider (1986) found that vocational agriculture teachers who had a more positive attitude toward SOE programs had a higher proportion of students with SOE programs in their current vocational agriculture program. Rhodes (1984) found that (a) SOE programs were widely supported by vocational agriculture teachers in Arizona; (b) the stronger a teacher's conviction of the value and need for SOE programs, the greater the rate of student participation; (c) teachers with a strong philosophical belief in the value and need for SOE programs did things that increased student participation. Smith (1982) found that vocational agriculture teachers in Oklahoma agreed that (a) SOE programs should be carried on outside the regular classroom, (b) SOE programs helped prepare students for an agricultural vocation, and (c) SOE programs were necessary for the adequate education of students in agriculture. Mlozi (1983) found that, in West Virginia, vocational agriculture teachers' beliefs in the importance of SOE programs and in their own ability to supervise were not considered

problems preventing proper supervision. On the other hand, excessive paperwork, few farm students in vocational agriculture, excessive family numbers, and family demands on their time were perceived as adversely influencing teachers' supervisory efforts.

Herren (1984) found that teachers who were working in programs with a strong emphasis on SOE saw SOE programs as helping make an agricultural program more vocational. These teachers believed that students should have SOE programs and that the vocational agriculture teacher should be the one to supervise those programs. However, these teachers were not interested in giving SOE programs or supervision, even considering the effects of the economic recession.

Harris (1983) reported that teachers believed SOE programs to be an integral and important part of agriscience. Teachers in low-quality programs placed a low emphasis on making supervisory visits and requiring SOE programs of their students. Conversely, teachers with high-quality SOE programs recognized the importance of those programs and had positive attitudes toward supervision. In addition, he found significant positive relationships between teachers' perceptions of the importance of SOE and attendance at the state agriscience teachers' conference, and number of teachers and students in the department.

Hembree (1983) conducted a study to determine agriculture teachers' perceptions of SAE programs in area I Texas agriscience departments. He found that 85% of the teachers required SOE programs and 85 percent indicated voluntary participation from 70% to 100% of the students. The major objectives of SOE programs ranked highest by the teachers were emphasis on character building, enhancement of classroom instruction, and management skills. Dunham (1983) found that about 54% of teachers reported conducting programs in which at least 75% of the students participated in SOE.

French (1983) reported that teachers in neither the top nor the bottom schools recognized their SAE programs as strong. Regular visits to students' homes were characteristic of teachers from top schools. Also teachers from top schools perceived their principals as being supportive of the SAE program.

Harris and Newcomb (1985) found that:

1. Teachers in areas I and II of Texas believed that SOE is an integral part of agriscience and that production agriculture students should have SAE programs.

2. Teachers in areas I and II of Texas supported the concept of SAE programs. Furthermore, the extent to which they were supervising SAE programs was greater than that reported in other recent studies from different parts of the country.

3. The quality of SAE programs was positively related to teachers' views of the importance of agricultural experience and their attitudes toward supervision of SOE programs.

4. Characteristics of teachers that were examined in this study did not begin to explain the variance in teachers' views of the importance of SOE programs, their attitudes toward supervision, or the quality of programs.

Wright (1989) found that teachers did not perceive SOE income as a primary goal in their programs. It was apparent that the teachers perceived an awareness among students, administrators, and community leaders concerning economic literacy and the impact of agriculture as well as the importance of students' SOE income to the local economy.

Bell (1984) found that agriculture instructors teaching in two-year semesterized programs and those teaching in programs semesterized for at least three years differed

significantly in their perception of 2 of 14 selected SOE program characteristics and on 2 of 13 selected FFA program characteristics.

Vocational agriculture teachers will be more effective in creating relevant supervised experiences for their students if they encounter similar experiences during their preservice preparation. In other words, if agriculture teachers are better prepared to conduct high-quality supervised experiences, the welfare of agriscience students will be enhanced (Elliot, et al, 1991). Berkey and Sutphin (1984) found that a majority of the teachers in their study had not conducted an SOE themselves, nor had taken a college course that primarily addressed SOE. Teachers had not written policies and plans for conducting SOE programs in their schools or stressed record keeping to their classes, but they perceived SOE as an important component of the agriscience program. Berkey and Sutphin recommended that adoption of state guidelines and procedures, along with in-service program, was needed.

Osborne (1988) found that majority of Illinois agricultural production teachers had limited formal training in providing SOE programs. In general, teachers tended to report a need to strengthen their SOE knowledge base. Reneau and Rioder (1986) reported that vocational agriculture teachers who had a SOE program in high school had a more positive attitude toward SAE programs and a higher portion of students with SAE programs than did their counterparts who had not a SOE program in high school. Arrington and McCracken (1983) indicated that 12 month teachers (who spent one year in an agriculture program in high school) provided more personalized instruction, as indicated by a higher degree of participation with fairs and more supervisory home visits.

This means that teacher education students typically are expected to apply the principles they learn in their classroom instruction on their own. Therefore, agriscience

teacher education programs must contain supervised experience components in which prospective teachers can learn how to develop, conduct, and supervise experience programs.

Summary

The review of precedent literature was presented to introduce the theoretical framework for the study to explain the importance of experience in education generally and in agriscience specifically. Most of the underpinnings for experiential learning articulated by agriscience educators are associated with the influence of John Dewey earlier in this century. Agriscience educators have responded by implementing SAE programs.

The review of literature, moreover, pointed to the importance of assessing the following issues: a) the philosophy, history, and definition of SAE programs, b) quality and importance of SAE programs, c) types of SAE programs, d) agriscience student involvement with SAE programs and, e) agriscience teacher involvement with SAE programs. These topics were drawn from the articles and studies that helped in the development of the research questionnaire which was used to determine Michigan agriscience teachers' perceptions of SAE programs.

CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

Introduction

The primary purpose of this study was to determine Michigan agriscience teachers' perceptions of selected aspects of SAE programs in Michigan high schools and vocational/career centers. The research design and methodology used to achieve this purpose are described in this chapter. The method used in the study is explained first, followed by an overview of research questions. The study population and data-collection instrument are then discussed. Data-collection methods and the issue of non-return error are discussed. Last, the techniques used to analyze the data are described.

Method of the Study

The descriptive survey research method was used in this study. Good (1963) stated, "Descriptive studies may include present facts or current conditions concerning the nature of a group of persons, a number of objects, or a class of events and may involve the procedures of induction, analysis, classification, enumeration, or measurement" (p. 244). In the field of education, according to Borg (1981):

> Most descriptive research can be roughly classified as either survey research or observational research. Survey research typically employs questionnaires and interviews in order to determine the opinions, attitudes, preferences, and perceptions of people of interest to the researcher. (Borg, 1981, 130)

Ary, Jacobs, and Razavieh (1996) explained four ways or methods by which data are collected in survey research: personal interview, telephone interview, mailed questionnaire, and directly administered questionnaire. Because this study intended to collect data from all Michigan agriscience teachers, a mailed questionnaire was thought to be the most appropriate method for this study.

Compared to other survey research techniques, a mailed questionnaire is likely to be less expensive. It is simply mailed to the respondents with a minimum of explanation. A mailed questionnaire also may place less pressure on respondent for an immediate response. When respondents are given ample time to fill out the questionnaire, they can consider each point carefully rather than replying with the first thought that comes to mind (Selting, 1965). Another advantage of a mailed questionnaire is that respondents may have greater confidence about their anonymity and thus feel freer to express views they fear might be disapproved of or might get them into trouble.

Overview of Research Questions

The primary purpose of this study was to determine Michigan agriscience teachers' perceptions of selected aspects of SAE programs in Michigan high schools and vocational centers. Eleven research questions were posed to guide the collection of data to achieve this purpose. Also selected demographic characteristics of the teachers were collected through the study questionnaire, and five additional research questions were posed to determine whether those demographic characteristics could be identified as predictors of the teachers' philosophies regarding SAE and their perceptions of benefits of SAE, factors affecting

students' involvement with SAE, the necessity of SAE, and the percentage of students who have SAE programs. The research questions are as follows:

1. What were Michigan agriscience teachers' philosophies regarding SAE programs?
2. What did Michigan agriscience teachers view as the benefits of SAE programs?
3. What factors did Michigan agriscience teachers think affect students' involvement with SAE programs?
4. Did Michigan agriscience teachers believe that SAE programs are necessary for agriscience students?
5. What did Michigan agriscience teachers perceive to be their agriscience departments' policies with regard to SAE programs?
6. What did Michigan agriscience teachers perceive to be their agriscience departments' functions with regard to SAE programs?
7. How much out-of-class work time did Michigan agriscience teachers spend supervising students' SAE programs?
8. How much time did Michigan agriscience teachers spend per visit in SAE program visitation/supervision?
9. To what degree will Michigan agriscience teachers emphasize student involvement with SAE programs in the future?
10. How much assistance did Michigan agriscience teachers provide to students' SAE programs?
11. How much assistance should be provided to students' SAE programs?
12. Could certain demographic characteristics of Michigan agriscience teachers be identified as predictors of teachers' philosophies regarding SAE programs?

13. Could certain demographic characteristics of Michigan agriscience teachers be identified as predictors of teachers' perceptions of the benefits of SAE programs?
14. Could certain demographic characteristics of Michigan agriscience teachers be identified as predictors of factors affecting students' involvement with SAE programs?
15. Could certain demographic characteristics of Michigan agriscience teachers be identified as predictors of teachers' perceptions of the necessity of SAE programs?
16. Could certain demographic characteristics of Michigan agriscience teachers be identified as predictors of the percentage of students who participate in SAE programs?

The Study Population

The population of this study included all of the agriscience teachers in Michigan high schools and vocational/career centers. To identify all of these teachers, a current list (for the 1996-1997 school year) of their names and addresses was obtained from the Department of Agricultural and Extension Education at Michigan State University. A total of 137 agriscience teachers constituted the population for this study.

Ary et al. (1996) indicated that with mailed questionnaire, it is possible to include a large number of subjects as well as subjects in diverse locations. Therefore, all 137 agriscience teachers in Michigan were selected as the population for this study. In selecting these agriscience teachers, it was assumed that they all were certified in agriscience and had SAE programs in their departments.

Development of The Instrument

A survey questionnaire was used as the main instrument for collecting the data for this study. The questionnaire was developed after reviewing the literature and studying other instruments that had been used to measure the perceptions of agriscience teachers regarding related agriscience issues in general and SAE programs in particular. Previously used instruments included those of Dyer and Osborne (1995), French (1983), Foster (1984), Gebhardt (1985), Herren and Cole (1984), Osborne (1988), Pals (1988, 1989), Rawls (1982), Smith (1982), Stewart (1991), and Sutphin (1984).

The questionnaire items were designed to answer the research questions and were grouped accordingly. The questions addressed teachers' philosophy regarding SAE programs, benefits of SAE programs, factors affecting students' involvement with SAE programs, the necessity of SAE programs, agriscience departments' policies with regard to SAE programs, agriscience departments' functions with regard to SAE programs, SAE visitations, teachers' future emphasis on students' involvement with SAE programs, and teachers' assistance with students' SAE programs.

The types of responses for the questions were formed using the Likert-type scale, "yes" or "no," and short subjective fill-in the blank responses. The first three sections of the questionnaire contained statements concerning teacher philosophy regarding SAE programs, benefits of SAE, and factors affecting students' involvement with SAE programs. Section four concerned whether teachers thought SAE programs were necessary. Section five contained items to determine teachers perceptions concerning selected policies of their agriscience departments toward SAE programs. Items in section six elicited teachers perceptions regarding selected functions of agriscience departments toward SAE programs.

Section seven concerned the percentage of teachers' out-of-class work and amount of time spent per visit in SAE visitation/supervision. Section eight was intended to identify teachers' emphasis on students' involvement with SAE programs in the future. The last section concerned the amount of assistance that teachers currently provided to students' SAE programs and what they should provide. Other items concerned some demographic characteristics of Michigan agriscience teachers (Appendix B).

The questionnaire was distributed to a jury of agricultural education professors in the Department of Agricultural and Extension Education at Michigan State University (Appendix F), to evaluate it and verify its content and face validity. Some of their suggestions and changes were incorporated into the final draft of the questionnaire before distributing it to the study subjects.

To determine the reliability of the questionnaire, it was distributed to a group of internship students who represented Michigan agriscience teachers. Their responses were analyzed using Cronbach's alpha coefficients in the Statistical Package for the Social Sciences (SPSS). The reliability coefficients were between .74 and .93, which were deemed acceptable for this study.

Data Collection

To collect the data for this study, the questionnaire was mailed to all of the agriscience teachers in Michigan high school and vocational/career centers. A cover letter, with an endorsement by the agricultural education consultant for the State of Michigan and the chairperson of the guidance committee, describing the purpose of the study was attached to the questionnaire (Appendix C). These materials, with an addressed and stamped return

envelope, were sent to all Michigan agriscience teachers in high schools and vocational/career centers through the school year of 1996/97. In general, to reach the maximum percentage of returns in a mailed questionnaire survey, planned follow-up mailings are essential (Ary et al., 1996).

> Despite the large number of research studies reporting techniques designed to improve response rates, there is no strong empirical evidence favoring any techniques other than the follow-up and the use of monetary incentives. A well planned follow-up is more than a reminder service. Each mailing provides a fresh opportunity for the researcher to appeal the return of a questionnaire. (Dillman, 1988)

However, through this study, two follow-up mailings were conducted. Afterwards, nonrespondents were telephoned to enhance the return rate. The first follow-up was sent two weeks after the original mailing, and the second follow-up was sent about two weeks after the first follow-up. Each follow-up mailing included a new cover letter, a replacement questionnaire, and another addressed and stamped return envelope. In the follow-up cover letter, the teachers were told that their completed questionnaires had not been received and the importance of their responses to the study's usefulness. The respondents also were told to ignore the request if they had already mailed the questionnaire. Two weeks later after the second follow-up mailing, phone calls were conducted to teachers who had not responded to the survey.

Non-return error

Ary et al., (1996) identified several factors that have been found to influence the return for a mailed questionnaire. Common factors are (a) the length of the questionnaire, (b) the cover letter, (c) the attractiveness of the questionnaire, (d) ease of completing the questionnaire and mailing it back, (e) interest aroused by the content, (f) use of a monetary

incentive, and (g) the follow-up procedures used. In this study, most of the above mentioned factors were taken into account to avoid non-return error.

After the original mailing of the questionnaire and the two follow-up mailings and the reminder telephone calls (according to Dillman, 1978), 102 of the 137 questionnaires had been returned for a response rate of 74.4%. Of that number, 95 questionnaires were usable and seven were returned without responses. The teachers who returned those seven questionnaires indicated that they did not have SAE programs in their schools. In comparing some demographic characteristics of the late respondents to those of early respondents, there were no significant differences between them. Thus, 74.4% was considered as an applicable return rate.

Data Analysis

The data gathered in the study were analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics such as frequencies, means, standard deviation, and percentages were used to analyze the overall perceptions of all participants who responded to the questionnaire. Multiple regression analysis was used to determine whether any of selected demographic characteristics of Michigan agriscience teachers could be identified as predictors of certain aspects of SAE programs. The findings are presented in Chapter IV

CHAPTER IV

FINDINGS OF THE STUDY

Introduction

This chapter contains an analysis of the data collected with the survey questionnaire in relation to the research questions pertaining to Michigan agriscience teachers' perceptions of selected aspects of SAE programs.

The responses to the questionnaire items were organized according to the research questions. Frequencies, means, and standard deviations were used to analyze the overall perceptions of the respondents completed and returned the questionnaire. Multiple regression analysis was used to determine whether any of selected demographic characteristics of the teachers were significant predictors of selected dependent variables: teachers' philosophies regarding SAE and teachers' perceptions of the benefits of SAE, factors affecting students' involvement with SAE, the necessity of SAE, and the percentage of students who participated in SAE.

Findings Pertaining to the Research Questions

Research Question 1

What were Michigan agriscience teachers' philosophies regarding SAE programs?

The questionnaire contained 14 items concerning teachers' philosophies regarding SAE programs. Teachers were asked to respond to each statement on a six point scale

ranging from firmly disagree (1) to firmly agree (6). The higher the mean score for each statement, the greater teachers' agreement with that item.

As shown in Table 1, Michigan agriscience teachers' mean ratings of their philosophies regarding various aspects of SAE programs ranged from 3.51 to 5.27. The three highest rated statements were (a) I am supportive of the SAE concept in agriscience (mean = 5.27, SD = .74) , (b) SAE is a valuable component of agriscience programs (mean = 5.19, SD = .75), and (c) Helping every student plan and conduct an SAE program is difficult (mean = 5.02, SD = .95). On the other hand, the three lowest rated statements were (a) SAE programs should be planned with a potential for profit (mean = 3.51, SD = 1.26), (b) Agriscience teachers should not establish minimum standards for the scope of individual SAE programs (mean = 3.85, SD = 1.48), and (c) Extra class credit should be provided for students completing SAE programs (mean = 3.87, SD = of 1.51).

Research Question 2

What did Michigan Agriscience teachers view as the benefits of SAE programs? The questionnaire contained 15 statements concerning teachers' perceptions of the benefits of SAE programs. Teachers were asked to respond to each statement on a six-point scale ranging from firmly disagree (1) to firmly agree (6). The higher the mean score for each item, the greater the teachers' agreement with that statement.

As shown in Table 2, Michigan agriscience teachers' mean ratings of the benefits of SAE ranged from 4.50 to 5.37.The three highest rated statements were (a) SAE programs provide opportunity to solve problems (mean = 5.37, SD = .53), (b) SAE programs provide opportunity to make decisions (mean = 5.30, SD = .54), and (c) SAE programs provide

Table 1
Michigan agriscience teachers' philosophies regarding SAE programs.

Statement	N	$\bar{x}$	S.D
I am supportive of the SAE concept in agriscience.	95	5.27	.74
SAE is a valuable component of agriscience programs.	95	5.19	.75
Helping every student plan and conduct an SAE program is difficult.	94	5.02	.95
I promote SAE programs in my agriscience classes.	95	4.90	.90
Improvement, exploratory, or supplementary skills should be a part of SAE programs.	94	4.82*	1.26
I am confident in my ability to help students carry out SAE programs	95	4.65	1.11
The SAE concept is workable in today's agriscience.	95	4.64*	1.21
I often use real problems met by students in their SAE programs	92	4.58	1.01
Every SAE program should include ownership, placement, or laboratory experience.	94	4.40	1.24
I have difficulties motivating students to conduct SAE programs.	95	4.35	1.07
Agriscience students should be required to conduct SAE programs.	95	4.23*	.73
Extra class credit should be provided for students completing SAE.	94	3.87*	1.51
Agriscience teachers should establish minimum standards for the scope of individual SAE programs.	95	3.85*	1.46
SAE programs should be planned with a potential for profit.	95	3.51	1.26

Scale: Firmly Disagree =1, Disagree = 2, Slightly Disagree = 3, Slightly Agree = 4, Agree =5, and Firmly Agree = 6.

* Converted from the negative values. These statements were negatively stated in the study questionnaire (Appendix B) so that their mean scores were converted to be ranged with those of positive statements.

opportunity for self learning (mean = 5.26, SD = .61. On the other hand, the lowest rated statement was "SAE programs help students earn money while in school" (mean = 4.50, SD = .96).

Table 2
Michigan agriscience teachers' perceptions of SAE benefits.

Benefits of SAE programs	N	$\bar{x}$	S.D
SAE programs provide opportunity to solve problems.	95	5.37	.53
SAE programs provide opportunity to make decisions.	95	5.30	.54
SAE programs provide opportunity for self learning.	95	5.26	.61
SAE programs promote acceptance of responsibility.	95	5.23	.82
SAE programs develop self-confidence.	95	5.17*	.82
SAE programs develop independence.	95	5.17	.66
SAE programs provide motivation to learn.	95	5.11	.72
SAE programs help make agriscience practical.	95	5.10	.90
SAE programs help prepare for agricultural occupations.	95	5.07	.72
SAE programs encourage record-keeping.	95	5.04	.78
SAE programs encourage use of business procedures.	95	4.98	.77
SAE programs help set educational goals.	95	4.79*	.88
SAE programs develop ability to manage money.	94	4.70	.81
SAE programs aid in choosing an occupation.	95	4.68*	1.02
SAE programs help students earn money while in school.	95	4.50*	.96

Scale: Firmly Disagree =1, Disagree = 2, Slightly Disagree = 3, Slightly Agree = 4, Agree =5, and Firmly Agree = 6.
* Converted from the negative values. These statements were negatively stated in the study questionnaire (Appendix B) so that their mean scores were converted to be ranged with those of positive statements.

Research Question 3

What factors did Michigan agriscience teachers think affect students' involvement with SAE programs?

Teachers were asked to rate 16 statements concerning factors affecting students' involvement with SAE programs. The rating scale was the same as for research questions 1

Table 3
Teachers' perceptions of factors affecting student involvement with SAE programs.

Statement	N	$\bar{x}$	S.D
Facilities available for SAE programs.	94	4.82	.97
Agriscience teacher commitment to SAE programs.	94	4.53	1.90
Parent ability to help with financing SAE programs.	94	4.49	1.01
Money available for students to finance SAE programs.	93	4.41	1.10
Employer support.	95	4.40	1.04
Teacher expectations of students.	95	4.36	1.17
Agriscience teacher perceptions of necessary program characteristics.	94	4.29	1.05
School-land laboratory available for student use.	94	4.22	1.33
The decline in the number of farms.	95	4.22	1.37
Students dislike maintaining SAE program records.	93	4.22	1.10
Agriscience teacher experience.	93	4.18	1.27
The agricultural background of students.	95	4.14	1.24
Teacher success with SAE programs prior to entering teaching process.	93	4.02	1.16
Students participation in activities other than sports is excessive.	93	3.88	1.35
Community attitudes about SAE programs.	93	3.88	1.22
Size of community.	94	3.48	1.33

Firmly Disagree =1, Disagree = 2, Slightly Disagree = 3, Slightly Agree = 4, Agree =5, and Firmly Agree = 6.

and 2. The higher the mean score for each factor, the greater the teachers' agreement with that factor. As shown in Table 3, Michigan agriscience teachers' mean ratings of these factors ranged from 3.48 to 4.82. The three highest rated factors were (a) Facilities available for SAE programs (mean = 4.82, SD = .97), (b) Agriscience teacher commitment to SAE programs (mean = 4.53, SD = 1.90), and (c) Parent ability to help with financing SAE programs (mean = 4.49, SD = .01). On the other hand, the lowest factor rated was "size of community" (mean = 3.48, SD = 1.33).

Research Question 4

> Did Michigan agriscience teachers believe that SAE programs are necessary for agriscience students?

To answer this research question, the teachers were asked, "Do you feel that SAE programs are necessary for adequate education of students in the field(s) of agriscience?"

All 95 teachers responded to this question. As shown in Table 4, 69 teachers (72.6%) indicated that SAE programs were necessary, and 26 teachers (27.4%) indicated that such programs were not necessary.

Table 4
Michigan agriscience teachers' perceptions of the necessity of SAE programs

Response	Frequency	%
Yes	69	72.6
No	26	27.4
Total	95	100.0

Research Question 5

What did Michigan agriscience teachers perceive to be their agriscience departments' policies toward SAE programs?

Five items were on the questionnaire focused on this research question. Each is stated below, along with the pertinent results:

1. Did your department have a written plan outlining SAE program requirements which students must fulfill?

Ninety-four teachers responded to this question. As shown in Table 5, 26 teachers (27.7%) indicated that their agriscience departments had written plans outlining SAE program requirements which their students must fulfill, whereas 68 teachers (72.3%) indicated that their departments did not have such plans.

Table 5
Percentage of agriscience departments that have written plans regarding SAE programs.

Response	Frequency	%
Yes	26	27.7
No	68	72.3
Total	94	100.0

2. Did your department require that all students enrolled in the agriscience program have SAE programs?

Ninety-four teachers responded to this question. As shown in Table 6, 37 teachers (39.4%) indicated that their agriscience departments required that all students have SAE programs. On the other hand, 57 teachers (60.6%) said that their agriscience departments did not require that all students have SAE programs.

Table 6
Agriscience departments' requirement of students have SAE programs.

Response	Frequency	%
Yes	37	39.4
No	57	60.6
Total	94	100.0

3. What percentage of the student's grade is dependent on his/her involvement with SAE programs?

Ninety-three teachers responded to this question. As shown in Table 7, the largest group of 44 teachers (47.3%) indicated that no percentage of a student's grade was dependent on his or her involvement with an SAE program. The second highest percentage of teachers (21.5%) indicated that 10% of the student's grade depended on his or her involvement with an SAE programs. Another 18.3% said that 20% of a student's grade was dependent on his or her involvement in an SAE program. Moreover, several teachers indicated different percentages of a student's grade was dependent on his or her involvement with an SAE program (Table 7).

Table 7
Percentage of student's grade dependent on his/her involvement in SAE programs.

Percentage of grade	Frequency	%
0	44	47.3
10	20	21.5
20	17	18.3
25	5	05.4
30	2	02.2
40	1	01.1
50	1	01.1
60	2	02.2
100	1	01.1
Total	93	100.0

$\bar{x}$ =11.13

4. What percentage of students had SAE programs in your department?

Eighty nine teachers responded to this question. As shown in Table 8, the largest group of 17 teachers (18.9%) indicated that from 91% to 100% of their students had SAE programs. Moreover, teachers in different categories indicated different percentages of their students had SAE programs (Table 8). The general mean was 54.80%.

Table 8
Percentage of students who had SAE programs according to Michigan agriscience teachers.

Percentage	Frequency	%
0	2	02.2
1 - 10	13	14.5
11- 20	6	06.6
21- 30	12	13.4
31- 40	7	07.7
41- 50	3	03.4
51- 60	6	06.6
61- 70	6	06.6
71- 80	10	11.3
81- 90	7	07.8
91- 100	17	18.9
Total	89	100.0

$\bar{x} = 54.8$

5. What percentage of students had the following different types of SAE programs: ownership, placement, laboratory, improvement, exploratory, and supplementary?

Eighty-seven teachers responded to this question. As shown in Table 9, Michigan agriscience teachers indicated that 23.26% of students had SAE ownership programs, 23.23% had SAE placement programs, 19.37% had laboratory programs, 8.56% had SAE improvement programs, 11.36% had SAE exploratory programs, and 11.37% had SAE supplementary activities.

Table 9
Percentage of students enrolled in the different types of SAE programs.

Types of SE programs	N	%
Ownership	87	23.26
Placement	87	23.23
Laboratory	87	19.37
Improvement	87	8.56
Exploratory	87	11.36
Supplementary	87	11.37

Research Question 6

What did Michigan agriscience teachers perceive to be their agriscience departments' functions with regard to SAE programs?

Four items were included to collect the data with which to answer this research question. They are stated below:

1. Did your agriscience department provide the following facilities for students to conduct their SAE programs: greenhouse, animal facilities, crop land, science lab, tree nursery, or others?

As shown in Table 10, 50.5% of the teachers indicated that their agriscience departments provided greenhouses to students for conducting SAE programs. Moreover, 33% of the teachers indicated animal facilities, 44.1% indicated crop lands, 55.3% indicated science labs, 26.6% indicated tree nurseries, and 30.9% indicated other facilities. Teachers sometimes indicated that more than one type of facility was provided.

With respect to other facilities provided by agriscience departments, five indicated forests, five indicated floral shops, four indicated landscaping, four indicated aquiculture,

three indicated hydroponics, three teachers indicated nature centers, three indicated woodlots, two indicated grounds, one indicated an agricultural mechanic lab, and one indicated a garden center.

Table 10
Facilities provided to agriscience students by their departments.

Facilities provided for students.	Response	Frequency	%
Greenhouses	Yes No	48 47	50.5 49.5
Animal facilities	Yes No	31 63	33.0 67.0
Crop land	Yes No	41 52	44.1 55.9
Science Lab	Yes No	52 42	55.3 44.7
Tree nursery	Yes No	25 69	26.6 73.4
Other facilities	Yes No	29 65	30.9 69.1

2. Did your agriscience program provide some type of project, such as animal chain, in which students initiate or participate in an SAE program?

Ninety-three teachers responded to this question. As shown in Table 11, 30 teachers (32.3%) indicated that their agriscience programs provided some projects in which students initiated or participated in SAE programs.

Table 11
Teachers' responses regarding provision of some type of project by their agriscience departments.

Response	Frequency	%
Yes	30	32.3
No	63	67.7
Total	93	100.0

3. Did the school provide you with a vehicle to be used for SAE program visitations?

Ninety-three teachers responded to this question. As shown in Table 12, 13 teachers (14%) indicated that their schools provided them with vehicles to be used for SAE program visitations whereas 80 teachers (86%) indicated that their schools did not provide them with vehicles.

Table 12
Teachers' responses regarding the schools providing them with a vehicle to be used for SAE program visitations.

Response	Frequency	%
Yes	13	14
No	80	86
Total	93	100

D. Did the school compensate you for use of your vehicle for SAE program visitations?

Eighty-eight teachers responded to this question. As shown in Table 13, 62 teachers (70.5%) indicated that their schools compensated them for the use of their vehicles. On the other hand 26 teachers (29.5%) indicated that their schools did not compensate them.

Table 13
Teachers' responses regarding the schools compensating them for using their vehicles in SAE visitations.

Response	Frequency	%
Yes	62	70.5
No	26	29.5
Total	88	100.0

Research Question 7

How much out-of-class work time did Michigan agriscience teachers spend supervising students' SAE programs?

In an attempt to answer this research question, teachers were asked: "Approximately what percentage of your out-of-class work is spent supervising students' SAE programs?"

Seventy-eight teachers responded to this question. As shown in Table 14, the largest group of 29 teachers (37.2%) indicated that they spent from 1% to 10% of their time as out-of-class work. The second highest percentage of teachers (20.5%) indicated that they spent from 11 to 20 percent. Moreover, several teachers indicated different percentages of out-of-class work. In general, Michigan agriscience teachers on average spent 15.88% of their teaching time as out-of-class work supervising students' SAE programs.

Table 14
Percentage of out- of- class work time teachers spent supervising students' SAE programs.

Percentage of out-of-class work	Frequency	%
0	14	17.9
1 - 10	29	37.2
11- 20	16	20.5
21- 30	9	11.6
31- 40	2	02.5
41- 50	6	07.7
51- 60	0	00.0
61- 70	1	01.3
71- 80	0	00.0
81- 90	1	01.3
Total	78	100.0

$\bar{x} = 15.88$

Research Question 8

How much time did Michigan agriscience teachers spend per visit in SAE visitation/ supervision?

In an attempt to answer this research question, teachers were asked: "What was the average (approximate) amount of time spent with students' SAE program per visit?

Seventy-seven teachers responded to this question. As shown in Table 15, the largest group of 20 teachers (25.9%) indicated that they spent from 21 to 30 minutes per visit. no percentage of a student's grade was dependent on his or her involvement with an SAE program. Moreover, several teachers indicated different amounts of time that spent per visit.

The average time Michigan agriscience teachers spent on SAE visitations per visit was 31.70 minutes.

Table 15
Amount of time (minutes) teachers spent with students' SAE programs per visit.

Amount of time (minutes) spent per visit	Frequency	%
0	16	20.8
1 - 10	1	01.3
11- 20	9	09.1
21- 30	20	25.9
31- 40	6	07.8
41- 50	14	18.2
51- 60	11	14.3
61- 70	0	00.0
71- 80	0	00.0
81- 90	1	01.3
90- 100	0	00.0
100-110	1	01.3
Total	77	100.0

$\bar{x} = 31.70$

Research Question 9

To what degree did Michigan agriscience teachers emphasize student involvement with SAE programs in the future?

To gather information with which to answer this question, teachers were asked: "In the future, do you plan to increase, maintain, or decrease, the level of involvement of your students with SAE programs?

As shown in Table 16, all 95 teachers responded to this question. Fifty-four teachers (56.8%) indicated that they planned to increase, 35 teachers (36.9%) indicated that they planned to maintain, and 6 teachers (6.3%) indicated that they planned to decrease the level of their students' involvement with SAE programs in the future .

Table 16
Future emphasis by Michigan agriscience teachers on their students' involvement with SAE programs.

Response	Frequency	%
Increase	54	56.8
Maintain	35	36.9
Decrease	6	06.3
Total	95	100.0

Research Question 10

How much assistance did Michigan agriscience teachers provide to students' SAE programs?

The questionnaire contained 13 items regarding the amount of assistance teachers currently provided to students' SAE programs. Teachers were asked to respond to each item in terms of the amount of assistance currently provided to students' SAE programs. Responses were given the following numerical weight: none = 1, small = 2, some = 3, large = 4, and great = 5.Thus, the higher the mean score for each item, the greater the amount of assistance teachers currently provided to students' SAE programs. Table 17 shows the amount of assistance that was currently provided to students' SAE programs in various capacities. Mean scores ranged from 2.21 to 3.02. The three highest rated areas of assistance were (a) selecting the proper type of SAE programs (mean = 3.02, SD = .83), (b) planning

of SAE programs (mean = 2.96, SD = .86), (c) development of incentives for SAE programs (mean = 2.93, SD = .83).

Table 17
Amount of assistance currently provided by Michigan agriscience teachers to students' SAE programs.

Items	N	$\bar{x}$	S.D
Selecting the proper type of SAE programs.	80	3.02	.83
Planning of SAE programs.	78	2.96	.86
Development of incentive for SAE programs.	78	2.93	.83
Evaluating SAE programs.	81	2.86	.96
Keeping records for SAE programs.	79	2.78	.89
Developing long-range plans for SAE programs.	78	2.69	.86
Managing SAE programs.	76	2.65	.99
Making general decisions.	74	2.58	.89
Developing parental agreement.	78	2.51	1.02
Financing SAE programs.	79	2.40	1.18
Providing counseling on reinvestment of profit.	80	2.31	1.02
Providing transportation for SAE program activities.	79	2.22	1.01
Developing budgets for SAE programs.	76	2.21	.91

Scale: Great = 1, Large = 2, Some = 3, Small = 4, and None = 5

On the other hand, the areas of assistance with the lowest mean ratings were (a) developing the budgets for SAE programs (mean = 2.21, SD = .91), (b) providing transportation for SAE activities (mean = 2.22, SD = 1.01), and (c) providing counseling on reinvestment of profit (mean = 2.31, SD = 1.02). Generally, Michigan agriscience teachers indicated that, with the exception of the first area, they currently provided a small amount of assistance in each area.

Research Question 11

How much assistance should be provided to students' SAE programs?

Teachers responded to the same 13 items as in research question 10, but this time in terms of how much assistance should be provided. The same five-point scale was used. Again, the higher the mean score for each item, the greater the amount of assistance teachers thought should be provided to students' SAE programs.

Table 18 shows the amount of assistance that teachers thought should be provided to students' SAE programs. Means ranged from 3.14 to 3.84. The three highest rated areas of assistance were (a) development of incentive for SAE (men = 3.84, SD = .74), (b) planning SAE programs (mean = 3.80, SD = .73), and (c) selecting the proper type of SAE programs (mean = 3.66, SD = .80). On the other hand, (a) providing transportation for SAE activities (mean = 3.14, SD = 1.10), and b) financing SAE programs (mean = 3.15, SD = 1.14) were the lowest rated areas of assistance. In general, Michigan agriscience teachers indicated that all of the listed areas of assistance should be provided to "some" degree.

Table 18
Amount of assistance that should be provided to students' SAE programs.

Items	N	$\bar{x}$	S.D
Development of incentive for SAE programs.	85	3.84	.74
Planning of SAE programs.	87	3.80	.73
Selecting the proper type of SAE programs.	87	3.66	.80
Keeping records for SAE programs.	84	3.61	.95
Developing long-range plans for SAE programs.	88	3.55	.96
Evaluating SAE programs.	88	3.55	1.04
Developing parental agreement.	86	3.42	.98
Managing SAE programs.	83	3.41	1.00
Developing budgets for SAE programs.	89	3.39	1.02
Providing counseling on reinvestment of profit.	85	3.36	1.01
Making general decisions.	87	3.28	.95
Financing SAE programs.	85	3.15	1.14
Providing transportation for SAE program activities.	86	3.14	1.10

Scale: Great = 1, Large = 2, Some = 3, Small = 4, None = 5

Results of the Demographic Analysis

The questionnaire contained nine items regarding selected demographic characteristics of Michigan agriscience teachers. These demographic characteristics were age, gender, highest educational degree completed, number of years teaching, agriscience area of emphasis, percentage of time spent on teaching agriscience, number of students enrolled in high school, number of students enrolled in agriscience classes, and type of school in which teachers taught. A description of the teachers according to these demographic characteristics is presented in the following pages:

Age

Michigan agriscience teachers ranged in age from 23 years to 59 years. The mean was 41.86 years (Table 19).

Table 19
Distribution of respondents by age.

Age in Years	Frequency	%
21 - 25	9	06.3
26 - 30	9	08.4
31 - 35	9	09.5
36 - 40	16	16.9
41 - 45	19	20.0
46 - 50	19	20.0
51 - 55	10	10.5
56 - 60	8	08.4
Total	95	100.0

$\bar{x} = 41.86$

Gender

Of the 95 teachers who participated in the study, 69 teachers (72.6%) were males and 26 teachers (27.4%) were females (Table 20).

Table 20
Gender of Michigan agriscience teachers.

Gender	Frequency	%
Male	69	72.6
Female	26	27.4
Total	95	100.0

The Highest Educational Degree Completed

Of the 95 teachers, 39 teachers (41.1%) indicated that the highest educational degree they had completed was a bachelor's degree. Fifty-one teachers (55.6%) had earned a master's degree, and five teachers (5.3%) had earned a specialist degree (Table 21).

Table 21
The highest educational degree completed by Michigan agriscience teachers.

Degree	Frequency	%
Bachelor	39	41.1
Master	51	55.6
Specialist	5	05.3
Total	95	100.0

Number of Years Teaching

Michigan agriscience teachers' number of years of teaching ranged from a minimum of 1 year to a maximum of 35 years. The mean was 15.76 years (Table 22).

Table 22
Number of years respondents had been teaching agriscience.

Years of teaching	N	%
1 - 5	18	18.9
6 - 10	20	20.0
11 - 15	9	09.5
16 - 20	14	14.7
21 - 25	15	15.8
26 - 30	11	11.6
31 - 35	8	08.4
Total	95	100.0

$\bar{x} = 15.76$

Area of Emphasis in Agriscience

Michigan agriscience teachers had various areas of emphasis; some indicated more than one area. Eighty one teachers (85%) indicated agriscience, 23 teachers (24.2%) indicated greenhouse, 18 (19%) indicated landscape, 18 teachers (19%) indicated floriculture, 5 teachers (5.3%) indicated agricultural mechanic, and 14 teachers (14.7%) indicated other areas of emphasis (Table 23). For other areas of emphasis, two teachers indicated nature center, two indicated natural resources, two indicated equine science, one indicated turf, one indicated science on agriscience, one indicated agronomy, one indicated environmental science, one indicated crops, one indicated forestry, and one teacher indicated agricultural communication.

Table 23
Teachers' area of emphasis in agriscience.

Area of emphasis	Frequency	%
Agriscience	81	85.0
Greenhouse	23	24.2
Landscape	18	18.9
Floriculture	18	18.9
Agricultural Mechanic	5	05.3
Other areas	14	14.7

* Teachers could choose more than one area at the same time.

Percent of Scheduled Time Spent on Teaching Agriscience

The percentages of scheduled time Michigan agriscience teachers indicated they spent on teaching agriscience varied from 15% to 100%. The mean was 73% (Table 24).

Table 24
Percentage of scheduled time teachers spent on teaching agriscience.

Percent of scheduled time	Frequency	%
1 - 10	0	00.0
11 - 20	6	06.5
21 - 30	2	02.1
31 - 40	7	07.5
41 - 50	12	12.9
51 - 60	5	05.4
61 - 70	6	06.5
71 - 80	12	12.9
81 - 90	3	03.2
91 - 100	40	43.0
Total	93	100.0

$\bar{x}$ = 73%

Number of Students Enrolled in High Schools Which Have Agriscience

The number of students enrolled in high schools that had agriscience varied from 44 to 2800. The mean was 678.5 students (Table 25).

Table 25
Number of students enrolled in Michigan high schools that had agriscience.

Number of students	Frequency	%
1 - 200	5	5.7
201 - 400	24	27.3
401 - 600	18	20.4
601 - 800	15	17.1
801 - 1000	11	12.5
1001- 1200	4	04.5
1201- 1400	4	04.5
1401- 1600	2	02.3
1601- 1800	0	00.0
1801- 2000	2	02.3
2001- 2200	2	02.3
2201- 2400	0	00.0
2401- 2600	0	00.0
2601- 2800	1	01.2
Total	88	100.0

$\bar{x}$ = 724.21

Number of Students Enrolled in Agriscience Classes

According to the 95 who participated in this study, the number of students enrolled in agriscience varied from a minimum of 11 to a maximum of 200. The mean was 72 students (Table 26).

Table 26
Number of students enrolled in agriscience classes.

Number of Students	Frequency	%
1 - 25	9	09.6
26 - 50	25	26.6
51 - 75	24	25.5
76 - 100	15	16.0
101 - 125	13	13.8
126 - 150	6	06.4
151 - 175	0	00.0
176 - 200	2	02.1
Total	94	100.0

$\bar{x} = 73$

Type of High School

Of the 95 teachers, 60 teachers (63.2%) indicated they were teaching in comprehensive high schools, 27 teachers (28.4%) indicated they were teaching in career centers, and 8 teachers (8.4%) indicated they were teaching in comprehensive high schools that are designated career centers (Table 27).

Table 27
Types of high schools in which Michigan agriscience teachers taught.

Type of high school	Frequency	%
Comprehensive high school	60	63.2
Career Center	27	28.4
Comprehensive high school that designated career center	8	8.4
Total	95	100.0

Based on the demographic characteristics of Michigan agriscience teachers collected through the questionnaire, five additional research questions were investigated in this study. Multiple regression analysis was performed to determine the best prediction models for explaining the variance in teachers' philosophies regarding SAE, perceptions of benefits of SAE, necessity of SAE, and percentage of students who had SAE. Twelve independent variables were included using the Stepwise regression method and at the .1 alpha level. The following results were obtained concerning prediction models between the demographic variables and the dependent variables.

Research Question 12

> Could certain demographic characteristics of Michigan agriscience teachers be identified as predictors of teachers' philosophies regarding SAE programs?

As shown in Table 28, the best model consisted of the two demographic characteristics: gender and scheduled time spent on teaching agriscience. In other words, gender and scheduled time spent on teaching agriscience were found to be significant predictors of teachers' philosophies regarding SAE programs. Gender produced a negative regression coefficient with teachers' philosophies regarding SAE programs. Thus, according to the numerical values assigned to the two gender groups (male = 1, female = 2), female teachers had lower philosophies regarding SAE programs. Male teachers could be predicted to have higher philosophical beliefs toward SAE programs.

On the other hand, the scheduled time spent on teaching agriscience produced a positive regression coefficient with teachers' philosophies regarding SAE programs. That is, the more time teachers spent on teaching agriscience, the higher were their philosophies toward SAE programs.

Table 28
Stepwise regression analysis regarding the selected demographic characteristics of Michigan agriscience teachers and teachers' philosophies regarding SAE programs.

Source of Variance	DF	Sum of Squares	Mean square	F	Sig. F
Regression	2	.964	.482	3.92	.048
Residual	84	10.194	.123		

Variables in the equation

Variable	b	R	R^2	Beta	t-value	Sig. t
Gender	-.17	.21	.05	-.20	-1.95	.054*
Scheduled time spent on teaching agriscience	.002	.29	.09	.20	1.92	.058*
Intercept	3.96				24.94	.000

* Significant at .1 level

Variables not in the equation

Variable	Beta	t-value	Sig. t
Age of respondents	.002	.021	.983
Highest educational degree completed:			
1. Bachelor's degree	.010	.111	.911
2. Master's degree	-.011	-.009	.993
3. Specialist	-.021	-.221	.826
Years teaching	.039	.339	.736
Number of student enrolled in high school	.093	.373	.710
Number of students enrolled in agriscience classes	.091	.814	.418
Type of high school in which teachers teach			
1. Comprehensive high school	.049	.442	.660
2. Career center	.047	.435	.665
3. Comprehensive high school that designated career center	-.14	-1.348	.181

Table 28 shows that two demographic characteristics explained a total of 9% of the variance associated with teachers' beliefs toward SAE programs. According to R^2 values and changes in R^2, gender explained 5% and the scheduled time explained 4% of the variance

associated with teachers' philosophies toward SAE programs. The predicted model could be calculated as follows.

$$Y = b_0 + b_1 x_1 + b_2 x_2$$

Where: Y = Predicted value
b_0 = Intercept
$b_1 x_1$ = Gender
$b_2 x_2$ = Scheduled time spent on teaching agriscience.

As shown in Table 28, none of the remaining independent variables (variables not in the equation) explained a significant proportion of the variance in teachers' philosophies regarding SAE programs.

Research Question 13

> Could certain demographic characteristics of Michigan agriscience teachers be identified as predictors of teachers' perceptions of the benefits of SAE programs?

As shown in Table 29, the demographic characteristic of career center, as a type of high school in which agriscience teachers taught, was found to be the only variable to fit the model. In other words, the variable of career center was found to be a significant positive predictor of teachers' perceptions of SAE benefits. Thus, teachers who worked in career centers had higher perceptions of SAE benefits.

Table 29 shows that the model had a multiple R value of .20 as a correlation coefficient between the two variables and a total R^2 value of .04 accounting for 4% of the variance in teachers' perceptions of SAE benefits. The prediction model could be calculated as follows:

$$Y = b_0 + b_1 x_1$$

where: Y = Predicted value
b_0 = Intercept
$b_1 x_1$ = Career center

Table 29 also shows that none of the remaining independent variables (variables not in the equation) explained a significant proportion of the variance in teachers' perceptions of SAE benefits.

Table 29
Stepwise regression analysis regarding the selected demographic characteristics of Michigan agriscience teachers and teachers' perceptions of SAE benefits.

Source of Variance	DF	Sum of Squares	Mean Square	F	Signi. F
Regression	1	1.01	1.11	4.11	.04
Residual	92	22.68	.25		

Variables in the equation

Variable	b	R	R^2	Beta	t. value	Sig. t
Career center	.23	.20	.04	.21	2.03	.045*
Intercept	4.62				22.66	.000

* Significant at .1 level

Variables not in the equation

Variable	Beta	t-value	Sig. t
Age of respondent	-.074	-.720	.473
Education			
1. Bachelor's degree	.087	.826	.410
2. Master's degree	-.085	-.824	.418
3. Specialist	.005	.050	.960
Years teaching	-.072	-.711	.479
Scheduled time spent on teaching agriscience	.165	1.595	.114
Number of students enrolled in high school	.046	.436	.664
Number of students enrolled in agriscience classes	.096	.894	.374
Type of high school			
1. Comprehensive high school	-.009	-.050	.960
2. Comprehensive high school that is designated career center	.005	.050	.960
Gender	-.043	-.416	.679

Research Question 14

> Could certain demographic characteristics of Michigan agriscience teachers be identified as predictors of factors affecting students' involvement with SAE programs?

As shown in Table 30, the demographic characteristic of career center, as a type of high school in which agriscience teachers taught, was found to be the most positive predictor of teachers' perceptions of factors affecting students' involvement with SAE programs. Thus, teachers who worked in career centers had higher perceptions of factors affecting students' involvement with SAE programs. The model had a multiple R value of .26 as a correlation coefficient between the two variables and had a total R^2 value of .07 accounting for 7% of the variance associated with perceptions of factors affecting student involvement with SAE programs. The prediction model could be calculated as follows:

$$Y = b_0 + b_1 x_1$$

where: Y = Predicted value
b_0 = Intercept
$b_1 x_1$ = Career center

Table 30 also shows also that none of the remaining independent variables (variables not in the equation) explained a significant proportion of the variance in teachers' perceptions of factors affecting student involvement with SAE programs.

Table 30
Stepwise regression analysis regarding the selected demographic characteristics of Michigan agriscience teachers and teachers' perceptions of factors affecting students' involvement with SAE programs.

Source of Variance	DF	Sum of Squares	Mean Square	F	Signi. F
Regression	1	2.424	2.424	6.263	.014
Residual	84	32.509	.387		

Variables in the equation

Variable	b	R	R^2	Beta	t. value	Sig. t
Career center	.39	.26	.07	.263	2.503	.045*
Intercept	3.50				12.407	.000

* Significant at .1 level

Variables not in the equation

Variable	Beta	t-value	Sig. t
Age of respondent.	.086	.882	.413
Education			
1. Bachelor's degree	.022	.207	.837
2. Master's degree	-.007	-.065	.949
3. Specialist	-.034	.328	.743
Years teaching	.132	1.260	.211
Scheduled time spent on teaching agriscience	-.045	-.416	.678
Number of students enrolled in high school	.133	1.185	.239
Number of students enrolled in agriscience classes	.127	1.166	.247
Type of high school			
1. Comprehensive high school	.268	1.556	.123
2. Comprehensive high school that is designated career center	-.165	-1.556	.123
Gender	-.043	-.416	.679

Research Question 15

Could certain demographic characteristics of Michigan agriscience teachers be identified as predictors of teachers' perceptions of the necessity of SAE programs?

As shown in Table 31, the demographic characteristic of gender was found to be the best predictor. In other words, gender was found to be a significant negative predictor of teachers' perceptions of the necessity of SAE programs. Thus, according to the numerical values assigned to the two gender groups (male =1, female =2), female teachers had lower perceptions of the necessity of SAE than did male teachers. Table 31 shows that the model had a multiple R value of .21 as a correlation coefficient between the two variables and had a total R^2 value of .04 accounting for 4% of the variance associated with teachers' perceptions of the necessity of SAE programs. The prediction model could be calculated as follows:

$$Y = b_0 + b_1 x_1$$

where: Y = Predicted value
b_0 = Intercept
$b_1 x_1$ = Gender

Table 31 also shows also that none of the remaining independent variables (variables not in the equation) explained a significant proportion of the variance in teachers' perceptions of the necessity of SAE programs.

Table 31
Stepwise regression analysis regarding the selected demographic characteristics of Michigan agriscience teachers and teachers' perceptions of the necessity of SAE programs.

Source of Variance	DF	Sum of squares	Mean square	F	Sig. F
Regression	1	.77	.77	3.93	.050
Residual	92	18.03	.20		

Variables in the equation

Variable	b	R	R^2	Beta	t. value	Sig. t
Gender of respondents	-.20	.21	.04	.20	-1.98	.050*
Intercept	.98				7.11	.000

* significant at .1 level

Variables not in the equation

Variables	Beta	t-value	Sig. t
Age of respondent	-.077	-.714	.477
Education			
1. Bachelor's degree	-.011	-.104	.917
2. Master's degree	.015	.150	.881
3. Specialist	-.110	-.107	.915
Years teaching	-.080	-.723	.471
Scheduled time spent in teaching agriscience	-.073	-.712	.478
Number of students enrolled in high school	-.006	-.061	.951
Number of students enrolled in agriscience classes	.085	.811	.420
Type of high school			
1. Comprehensive high school	-.154	-1.511	.134
2. Career center	.113	1.084	.281
3. Comprehensive high school that is designated career center	.089	.866	.389

Research Question 16

> Could certain demographic characteristics of Michigan agriscience teachers be identified as predictors of the percentage of students who participate in SAE programs?

As shown in Table 32, the best model consisted of three demographic characteristics: comprehensive high school, gender, and years teaching. In other words, these three independent variables were found to be significant predictors of the percentage of students who have SAE programs. Two demographic variables, gender and comprehensive high school produced negative regression coefficients. Thus, female teachers and teachers who worked in a comprehensive high school had a lower percentage of students who had SAE. On the other hand, the demographic variable of "years teaching" produced a positive regression coefficient. Thus, the more teaching experience for teacher, the higher percentage of students who have SAE programs. Table 32 shows that these three variables explained a total of 16.8% of the variance associated with the percentage of students who have SAE programs. According to the R^2 values and change in R^2, comprehensive high school explained 8.1%, gender explained 4.9%, and teaching experience explained 3.8% of the variance associated with the percentage of students who have SAE programs. The prediction model could be calculated as follows:

$$Y = b_0 + b_1 x_1 + b_2 x_2 + b_3 x_3$$

where: Y = Predicted value
b_0 = Intercept
$b_1 x_1$ = Comprehensive high school
$b_2 x_2$ = Gender
$b_3 x_3$ = Teaching experience

Table 32 also shows that none of the remaining independent variables (variables not in the equation) explained a significant proportion of the variance in the percentage of students have SAE programs.

Table 32
Stepwise regression analysis regarding the selected demographic characteristics of Michigan agriscience teachers and percentage of students having SAE programs.

Source of Variance	DF	Sum of Squares	Mean Square	F	Sig. F
Regression	3	16798.32	5599.44	5.70	.001
Residual	85	83475.19	982.06		

Variables in the equation

Variable	b	R	R^2	Beta	t-value	Sig. t
Comprehensive high school	-15.74	.286	.081	-.225	-2.24	.027*
Gender	-13.89	.362	.130	-.181	-1.69	.093*
Teaching years	.70	.409	.167	.204	1.93	.056*
Intercept	18.94				5.13	.000

* Significant at .1 level

Variables not in the equation

Variable	Beta	t-value	Sig. t
Age	-.067	-.401	.689
Education			
1. Bachelor's degree.	.024	.210	.834
2. Master's degree.	-.016	-.151	.880
3. Specialist.	-.009	-.088	.930
Scheduled time spent on teaching agriscience.	.160	1.524	.131
Number of students enrolled in high school.	.108	1.027	.307
Number of students enrolled in agriscience.	-.131	-1.088	.279
Type of high school:			
1. Career center	.115	.662	.059
2. Comprehensive high school that designated career center.	-.074	-.662	.059

CHAPTER V

SUMMARY, DISCUSSION OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

This chapter contains a summary of the study, a discussion of findings, conclusions drawn from the findings, recommendations based on the findings and conclusions of the study. The chapter is concluded by some suggestions for further studies.

Summary of The Study

Agriscience in public schools has a rich heritage of developing students' personal skills, as well as providing the abilities needed for agricultural employment. Agriscience students have opportunities to apply the subject matter to real-life situations. Application of subject matter comes about through a deliberate program of experience conducted by the student and supervised by the agriscience teacher. SAE programs systematically involve students in real-life situations involving agricultural experiences that are planned and supervised as a part of the agriscience curriculum.

Several studies have been conducted around the United States to describe the status of SAE programs and to determine the perceptions of students, parents, employers, and agriscience teachers regarding those programs. The studies concerning agriscience teachers' perceptions of SAE programs found the agriscience teacher as one of several factors affected

the success of such programs. Because of the key role of the agriscience teacher and the changes that have taken place in agriscience programs in general and SAE programs in particular, it was logical to undertake a study concerning Michigan agriscience teachers' perceptions of SAE programs.

The main purpose of this study was to determine Michigan agriscience teachers' perceptions of selected aspects of SAE programs. To achieve this main purpose, several research questions were investigated through the study. Because some demographic characteristics of Michigan agriscience teachers were collected through the study questionnaire, five additional research questions were conducted and investigated through the study. However, all research questions are listed below:

1. What were Michigan agriscience teachers' philosophies regarding SAE programs?
2. What did Michigan agrisceince teachers view as the benefits of SAE programs?
3. What factors did Michigan agriscience teachers think affected students' involvement with SAE programs?
4. Did Michigan agriscience teachers believe that SAE programs are necessary for agriscience students?
5 What did Michigan agriscience teachers perceive to be their agriscience departments' policies with regard to SAE programs?
6. What did Michigan agriscience teachers perceive to be their agriscience departments' functions with regard to SAE programs?
7. How much out-of-class-work time did Michigan agriscience teachers spend supervising students' SAE programs?

8. How much time did Michigan agriscience teachers spend per visit in SAE program visitations?
9. To what degree did Michigan agriscience teachers emphasize students' involvement with SAE programs in the future?
10. How much assistance did Michigan agriscience teachers provide to students' SAE programs?
11. How much assistance should be provided to students' SAE programs?
12. Could certain demographic characteristics of Michigan agriscience teachers be identified as predictors of teachers' philosophies regarding SAE programs?
13. Could certain demographic characteristics of Michigan agriscience teachers be identified as predictors of teachers' perceptions of the benefits of SAE programs?
14. Could certain demographic characteristics of Michigan agriscience teachers be identified as predictors of factors affecting students' involvement with SAE programs?
15. Could certain demographic characteristics of Michigan agriscience teachers be identified as predictors of teachers' perceptions of the necessity of SAE programs?
16. Could certain demographic characteristics of Michigan agriscience teachers be identified as predictors of the percentage of students who participate in SAE programs?

This study was conducted within the limitations of focusing on agriscience teachers in Michigan high schools and vocational/career centers. Analyzing the data was dependent on the perceptions addressed in the questionnaire developed for this study.

Through this study it was assumed that all Michigan agriscience teachers could currently perceive their role as agriscience teachers, were engaged in an effective agriscience program, acquainted with SAE programs and cooperated to complete and return the questionnaire. It was also assumed that the instrument used for data collection determined adequately the perceptions of the study population regarding SAE programs.

Since the philosophy behind supervised agricultural experience programs is experiential learning or learning by doing, a theoretical framework was presented at the beginning of review of literature. This theoretical framework concerned Dewey's opinions and other ideas about experience generally and experiential learning through agriscience specifically. Moreover, the review of literature focused on philosophy, history, and definition of SAE programs, quality and importance of SAE programs, types of SAE programs, agriscience students' and teachers' involvement with SAE programs.

A descriptive survey research method was used in carrying out this study. Because the population of this study comprised all of the Michigan agriscience teachers (n = 137) in high schools and vocational/career centers, a mailed questionnaire was thought to be the most appropriate method for collecting the data of this study. The questionnaire was developed following a review of literature and instruments related to agriscience in general and to SAE programs in particular.

Data were analyzed using the Statistical Package for the Social Sciences (SPSS). Frequencies, means, standard deviations, and percentages were used to analyze the overall perceptions of all respondents. Multiple regression analysis was used to determine whether

any of the selected demographic characteristics could be identified as predictors of certain aspects of SAE programs. The study findings are discussed in the following section.

Discussion of Findings

Research Question 1. What were Michigan agriscience teachers' philosophies regarding SAE programs?

Michigan agriscience teachers philosophically supported the SAE concept and indicated it as a valuable component of agriscience. Moreover, they viewed it as a workable concept and promoted it in their agriscience classes. They also agreed on ownership, placement, laboratory, improvement, exploratory, and supplementary skills as types of SAE programs. Some of these results agree with those from Osborne's (1988)study in Illinois. Osborne concluded that Illinois vocational agriculture teachers were very supportive of the SAE concept and indicated that SAE is a valuable component and promoted it in their vocational agriculture programs, but they felt neutral toward the types of SAE. In the current study, Michigan agriscience teachers indicated that they were confident about providing assistance to students. However, helping every student plan and conduct a SAE program was demanding, and they had difficulties motivating students. Osborne found that Illinois teachers were confident about helping students but felt neutral toward helping every student conduct SAE programs. He also found that teachers cited lack of student motivation as the major problem they encountered when helping students plan and conduct SAE programs. Whereas Cole and Herren (1983) found that Oregon agriscience teachers disagreed with the statement that "SAE programs should not be required for all students," Michigan teachers in this study indicated that all agriscience students should be required to conduct SAE programs.

Research Question 2: What did Michigan agrisceince teachers view as the benefits of SAE programs?

Michigan agriscience teachers agreed on several benefits of SAE programs, including solving problems, making decisions, self-learning, acceptance of responsibility, developing independence, motivation to learn, and use of business procedures. SAE programs were also considered to be useful in preparing for agricultural occupations, choosing an occupation, managing money, setting educational goals, helping students earn money while in school, encouraging record-keeping, and developing self-confidence. The results of this research question were consistent with those of Pals (1988). He found that parents, instructors, and employers rated 30 SAE benefit items, including most of the benefit items presented in the current study, higher than 5 (average benefit). The results of this question also were consistent with the SAE benefits reported in Experiencing Agriculture: A Handbook on Supervised Agricultural Experience (Barrick et al., 1992).

Generally speaking, SAE programs are designed to help students plan, budget, make decisions, solve problems, evaluate activities, earn awards, and keep accurate records. Moreover, these programs provide the valuable and occupational experiences that make education relevant (Elliot et al., 1991). Through SAE programs, students "learn by doing" and apply agricultural knowledge and skills learned in the classroom, and laboratory in an "away from the classroom" setting. This helps to "bridge the gap" between education and employment and results in a thorough more deeply found learning experience. SAE also provides benefits to teachers, employers, agricultural education programs, communities and the agricultural industry (Barrick et al., 1992).

Research Question 3: What factors did Michigan agriscience teachers think affected students' involvement with SAE programs?

Michigan agriscience teachers slightly agreed with several factors thought to affect students' involvement with SAE programs. They agreed with the factors (a) money available for students to finance SAE, (b) parent ability to help with financing SAE, (c) facilities available for SAE, (d) school land-laboratory available, and (e) students dislike maintaining program records. Foster (1984) found that Nebraska agriscience teachers indicated these five factors were among the ten factors most affecting students' participation in SAE programs, but he found "community attitudes about SAE programs" to be one of the factors least affecting students' participation in SAE-- the same result as in this study regarding that factor. Whereas Foster found "student participation in activities other than sports is excessive" to be one of the ten factors most affecting participation in SAE, Michigan agriscience teachers slightly disagreed on that factor. On the other hand, whereas Foster found "agriscience teacher experience" to be one of the five factors least affecting students' participation in SAE, in this study, it was one of the highest rated factors affecting students' involvement with SAE programs.

Findings from the current study were consistent with those from Sutphin's study (1984). Sutphin found "the increasing number of students from urban and suburban backgrounds," and "the decline in the number of farms" to be factors affecting students' involvement with SAE programs.

Bell (1984) indicated that the factor "agriculture instructor perceptions of necessary program characteristics" affected students' involvement with SAE and FFA. However, in the current study, Michigan agriscience teachers slightly disagreed with that factor.

Findings from the current study also agreed with those from Gebhardt's (1985) study. In particular, "teacher commitment to SAE" and "employers' support" were found to affect students' involvement with SAE programs. Gebhardt concluded that "size of community" was one of the least important factors affecting students' participation in SAE programs--the same result as in this study. Gebhardt also concluded that "teacher success with SAE programs prior to entering the teaching process" was one of the least important factors affecting students' participation in SAE. Michigan teachers, in this study, agreed with that factor.

Finally, there was an agreement between this study and French's (1983) study concerning the factor "teacher expectations of students," which was found to affect students' involvement with the SAE programs. Dyer and Osborne (1996) also reported that teacher expectations strongly influenced the quality of SAE programs.

Research Question 4: Did Michigan agriscience teachers believe that SAE programs are necessary for agriscience students?

When Michigan agriscience teachers were asked to determine whether they thought SAE programs were necessary for agriscience students, the majority (69 teachers or 72.6 %) indicated that SAE programs were necessary. Smith (1982) found that 97.2% of Oklahoma vocational agriculture teachers thought that SAE programs were necessary for their students. In general, the concept of SAE has stood the test of time and has made a difference in the lives of many students. SAE programs, designed to meet students' educational needs, should continue as an integral part of today's agriscience program. Agriscience teachers must learn from past experience and provide opportunities for their students to gain concrete, real experiences in the many facets of the agricultural industry through quality SAE programs.

Newcomb et al. (1986) indicated that the need for supervised practice in agriscience was established because of students' improved learning, personal development, and occupational development.

Research Question 5: What did Michigan agriscience teachers perceive to be their agriscience departments' policies with regard to SAE programs?

Of the Michigan agriscience teachers who participated in this study, 27.7 % indicated that their agriscience departments had written plans outlining SAE requirements. This percentage was lower than those in other studies. Foster (1984) found that 40% of Nebraska agriculture teachers said that their departments had written SAE policies, and Smith (1982) found that 68% of Oklahoma vocational agriculture teachers had written plans for SAE programs. Boone et al. (1987) found that 25% of the agricultural education programs in New York did not have an SAE written plan for students. However, they noted that a carefully written plan for SAE program is one of several standards mentioned by Maltby (1928) and is still applicable in today's agriscience program.

Thirty-nine percent of Michigan agriscience teachers indicated that their agriscience departments required all students enrolled in agriscience programs to have SAE programs. Although only 39% of departments required students to have SAE programs, teachers thought that all agriscience students should be required to have such programs. They agreed with the statement that "agriscience students should be required to conduct an SAE program." Smith found that 75% of Oklahoma vocational agriculture teachers indicated that their departments required all students enrolled in agriscience to have SAE programs. Amberson (1967) explained that most state plans for vocational education indicated that all

students enrolled in vocational agriculture should have SOE as a part of their instructional program.

In Michigan agriscience departments, it was found that an average of 11.13% of the student's grade depended on his or her involvement with an SAE program. This result was similar to that in Osborne's (1988) study. He found that most Illinois vocational agriculture teachers allotted 10% of the student's grade for SAE programs. In Smith's (1982) study, Oklahoma vocational agriculture teachers indicated that 26.8% of a student's grade was dependent on his or her involvement with SAE programs. In this study, Michigan agriscience teachers believed that extra class credit should not be provided for students completing SAE programs.

It was also found that 55% of Michigan agriscience students had SAE programs. Studies in other states found different percentages of students with SAE programs. In Missouri, Stewart (1991) reported that, in 1982/83, 82% of Missouri secondary agriculture students completed experience programs, compared with 86% in 1987/88. Foster (1984) found that 90% of agricultural education students participated in SAE programs. Penrod (1984) found that, in New York, less than 30% of students in high school vocational agricultural programs had SOE programs. In Areas I and II In Texas, Harris (1983) found that 58% of the departments reported 100% of the students with SAE programs.

Concerning the different types of SAE programs, it was found that 23.26% of Michigan agriscience students had SAE ownership programs, 23.23% had SAE placement, 19.37% had SAE laboratory, 8.56% had SAE improvement, 11.36% had SAE exploratory, and 11.37 had SAE supplementary programs. This finding was consistent with Phipps and Osborne's (1988) contention that ownership, placement, and laboratory experience represent

the three major types of SAE programs and that improvement, exploratory, and supplementary represent the additional components of SAE programs. So, according to the above percentages, more students were involved with the major types of SAE programs than in the other components in Michigan agriscience departments. Although teachers indicated that higher percentages of students had the major types of SAE programs, they supported each of the above mentioned six types of SAE programs. They agreed with the statements "Every SAE program should include ownership, placement, or laboratory experience" and "Improvement, exploratory, and supplementary skills should be a part of SAE programs." Hence, they positively perceived and agreed with the six types of SAE programs. Michigan agriscience teachers' support of the major types as well as the additional components of programs was consistent with Phipps and Osborne's (1988) point of view that "no SOE program is complete until improvement projects and supplementary skills have been incorporated. The addition of these phases of supervised occupational experience provides further opportunities for development and transfer of agricultural skills and helps 'round-out' the SOE program" (p. 319). They added that exploratory experience is an important ingredient of SOE programs for all students studying agriculture, regardless of their career goals.

Other studies found different results with respect to percentages of students who had the different types of SAE programs. Stewart (1991) reported that between 1982/83 and 1987/88, the number of Missouri agriculture students completed only ownership programs decreased from 66% to 44%. During that time, he reported, the number of students participating in both ownership and placement programs increased from 12% in 1982/83 to 20% in 1987/88. Agriscience teachers in other states required students to complete certain

types of SAE programs. Osborne (1988) reported that of those teachers who required SOE programs, 36.8 % required ownership or placement projects and 47% required improvement practices or supplementary skills.

Finally, although the percentages for this research question seemed to be low compared to the results of other studies, they were consistent among themselves. Because the majority of Michigan agriscience departments did not have written plans and did not require all students to have SAE programs, it is logical that there would be low percentage of students who had SAE programs generally and different types of SAE specifically.

Research Question 6: What did Michigan agriscience teachers perceive to be their agriscience departments' functions with regard to SAE programs?

When Michigan agriscience teachers were asked to indicate the facilities their departments provided to students, 55.3% indicated that their students were provided with science labs, 50.5% indicated greenhouses, 44% indicated crop land, 33% indicated animal facilities, 26.6% indicated tree nurseries, and 40% indicated other facilities (nature area/center, grounds, aquaculture, hydroponics, forest, floral shop/lab, woodlots, agricultural mechanic lab, landscaping, and garden center). Other studies found different percentages and relationships between facilities provided for conducting SAE programs and quality of SAE programs. Miller (1980) reported that North Carolina agriscience teachers indicated that three facilities were commonly used to provide simulated SAE opportunities. These three facilities were greenhouses, land laboratories, and land laboratory equipment, which were identified by 38%, 50%, and 58%, of the teachers, respectively. Anyadoh and Barrick (1990) concluded that a significant positive relationship existed between availability of school facilities and the quality of SAE programs. Beeman (1967) reported that a majority of vocational agriculture

teachers and school administrators agreed that schools should provide land to agriculture programs for instructional use. Dyer and Osborne (1996) concluded that school-site lab facilities are essential if teachers are to provide quality SAE programs for today's students. Both teachers and administrators agreed that schools should provide SAE facilities. They added that, with an increasing number of students living in suburban and urban areas, the responsibility and opportunity to provide quality SAE projects is quickly shifting from program partners to the school. In planning for agricultural education programs, school systems should provide adequate lab facilities (both production and nonproduction oriented) for students to conduct quality SAE programs.

Also, 32.3% of Michigan agriscience teachers indicated that their agriscience programs provided some projects in which students initiated SAE programs. In Oklahoma, Smith (1982) found that 49.5% of agriscience teachers reported that a project existed within their departments whereby students might participate or initiate experience programs.

With respect to transportation provided for SAE visitations, the majority of Michigan agriscience teachers in this study indicated that their schools did not provide them with vehicles to be used for SAE visitations but compensated them for using their own vehicles. Smith (1982) found that 97% of vocational agriculture teachers in his study indicated that they were provided a pickup for their use in visiting student projects. In general, Case (1983) stated that provision of adequate travel funds for SAE visitation/supervision was one of several efforts found to improve SAE quality.

Research Question 7: How much out-of-class work time did Michigan agriscience teachers spend supervising students' SAE programs?

Michigan agriscience teachers indicated that 14.57% of their teaching time was spent as out-of-class work in SAE visitation/supervision. This percentage was less than that cited in Smith's (1982) study. He found that Oklahoma vocational agriculture teachers spent 23.78% of their time as out-of-class work spent in visiting/supervising students' SAE programs.

Research Question 8: How much time did Michigan agriscience teachers spend per visit in SAE visitation/supervision?

Michigan agriscience teachers indicated that they spent an average of 31 minutes per visit through their out-of-class work with students' SAE programs.

In relation to questions 7 and 8, which focused on SAE visitations, Phipps and Osborne (1988) indicated that the number of supervisory visits made per year will vary, depending on the teacher load, the nature of SAE, and the travel budget. In this study, because the majority of Michigan agriscience teachers indicated that their schools did not provide them with vehicles for SAE visitations and just 55% of the students had SAE programs, it may be logical that the average percentage of teachers' out-of-class work spent in SAE visitation/supervision was only 14.57%. In general, out-of-class work, through SAE visitation/supervision, is essential for conducting and developing SAE programs. Watkins (1981) reported that the majority of agricultural employers in her study believed that students benefitted by teacher visits to the work site. Anyadoh (1989), Gibson (1987), and Harris (1983) all reported positive relationships between the number of supervisory visits and the quality of supervised experience programs. Dyer and Osborne (1996) reported that the quality and size of SAE programs had been found to be significantly and positively related to the number of supervised visits made by teachers.

Agriscience teachers need to balance their time between classroom instruction and out-of-class work. An important part of the teacher's task in conducting SAE supervision is to ensure that sufficient time and resources are available for this instructional activity. Dillon (cited in Waren & Flowers, 1993) stated that agriscience teachers who are conducting a full-day school program, complete with FFA and SAE phases, should be efficient managers of time in order to serve all students.

Research Question 9: To what degree did Michigan agriscience teachers emphasize student involvement with SAE programs in the future?

The majority of Michigan agriscience teachers in this study indicated that they planned to maintain or increase their emphasis on student involvement with SAE programs in the future. Smith (1982) also found that Oklahoma vocational agriculture teachers indicated that they planned to maintain or increase their emphasis on student involvement withe SAE programs. Miller (1980) reported that when North Carolina agriculture teachers were asked about emphasizing the place of SAE in the future, 50% of the teachers said that it could be increased. The results for this research question were consistent with the teachers' previous agreement with statements regarding their philosophies toward SAE programs, benefits of SAE programs, and the necessity of SAE. Because agriscience teachers had positive perceptions regarding their philosophies toward SAE, the benefits of SAE, and the necessity of SAE, it is logical that they would plan to maintain on increase students' involvement with SAE programs in the future.

Research Question 10: How much assistance did Michigan agriscience teachers currently provide to students' SAE programs?

Michigan agriscience teachers indicated that they currently provide a "small" amount of assistance to students' SAE programs. This assistance related to the areas of incentive for SAE programs, planning, parental agreements, long-range plans, budgeting, financing, managing, keeping records, counseling, transportation, evaluation, and making decisions. Teachers rated a) selecting the proper type of SAE, b) planning of SAE, and c) development of incentives for SAE as the three highest areas of assistance they currently provided to students' SAE programs. The first area of assistance was provided in "some" amount, whereas the second and third areas were provided in "small" amounts. Smith (1982) found that Oklahoma vocational agriculture teachers thought that development of incentives for SAE, planning, keeping records, counseling, transportation, and evaluation were the areas in which they currently provided a "large" amount of assistance. He also found that selecting the proper type of SAE, parental agreement, long-range plans, budgeting, financing, managing, and general decisions were the areas in which they currently provided a "moderate" amount of assistance.

Research Question 11: How much assistance should be provided to students' SAE programs?

Michigan agriscience teachers thought that they should increase the amount of assistance they provide to students' SAE programs. They also rated the same three areas they rated highest in question 10 -- development of incentives for SAE, planning of SAE, and selecting the proper type of SAE as the three highest areas that should be provided to students' SAE programs. In general, teachers thought that all areas of assistance should be provided in "some" amount instead of the "small" amount of assistance that they currently provided.

Several studies have been concerned with the assistance provided to students through conducting SAE programs. Williams (1980) identified five ways teachers provide assistance to students in the SAE activity. Teachers aid students by: a) assisting in record keeping on SAE programs, b) providing encouragement for the SAE programs, c) summarizing the records for the SAE programs, d) learning skills in agriculture, and e) setting educational goals in agriculture. Reneau and Roider (1986) stated that vocational agriculture teachers have played an important role in students' acceptance of and involvement with SAE programs. Williams (1979) found that students received significantly more assistance with 16 of 30 items from parents than from teachers. These 16 items were related to development of interest in agriculture, providing resources for agricultural production projects, producing and marketing agricultural products, and making business management decisions. On the other hand, the same students perceived that they received significantly more assistance from teachers than parents with 9 of 30 items. These nine items were related to providing encouragement, keeping and using records, developing plans, setting goals for SAE, and evaluating SAE programs.

> Research Question 12: Could certain demographic characteristics of Michigan agriscience teachers be identified as predictors of teachers' philosophies regarding SAE programs?

When all 12 independent variables were included using the stepwise regression method at the .1 alpha level, the best model consisted of the two demographic characteristics (independent variables), gender and scheduled time spent on teaching agriscience. The two variables were found to be significant predictors of teachers' philosophies regarding SAE programs. Whereas gender was found to be a significant negative predictor, scheduled time

spent on teaching agriscience was found to be a significant positive predictor of teachers' philosophies regarding SAE programs. Thus, according to the numerical values assigned to the two gender groups (male = 1, female = 2), the female agriscience teachers had lower philosophies regarding SAE programs and male teachers could be predicted to have higher philosophies regarding those programs. Further, the more the percentage of time spent on teaching agriscience, the more positive were teachers' philosophies regarding SAE programs.

In this study, female agriscience teachers were found to have less teaching experience, less scheduled time spent on teaching agriscience, and fewer students enrolled in agriscience than their male counterparts. So perhaps these female teachers had not philosophically developed the principles and components of SAE programs as much as the male teachers. This, consequently, could be reflected in their attitudes and beliefs toward SAE programs.

Concerning time spent on teaching agriscience, to be a significant positive predictor of the teachers' philosophies regarding SAE may be logical. When agriscience teachers spend a high percentage of their time on teaching agriscience, they can be involved in all aspects of the agriscience program, including SAE programs; consequently, this can be reflected in their philosophies toward SAE programs. In general, time spent on teaching agriscience can affect the quality of SAE which is basically dependent on classroom instruction, cooperative relationships, and on-site visitation/supervision. Straquadine (1990) found that the amount of time spent on teaching agricultural courses was significantly and positively related to SAE quality.

> Research Question 13: Could certain demographic characteristics of Michigan agriscience teachers be identified as predictors of teachers' perceptions of the benefits of SAE programs?

When all 12 independent variables were included using the stepwise regression method at the .1 alpha level, the demographic characteristic career center, as one of the high school types in which agriscience teachers taught, was found to be a significant positive predictor of SAE benefits. Thus teachers who worked in career centers had higher perceptions of SAE benefits. Because the philosophy behind SAE programs is experiential learning or learning by doing, this may be more successfully applied in career centers. Consequently, the benefits for participants may be more evident in those centers than in other high school types. Career centers originally were designed to ensure that students have the opportunity to become aware of all occupational areas and explore preferred areas further. In career centers also, students were provided the opportunity to develop general employment skills and abilities specific to their selected occupational area.

By looking at SAE, we find that it is "supervised" because it needs the supervision of others, it is "agricultural" because it helps prepare for occupations in agriculture, it is "experience" because it focuses on learning by doing and allows students to apply practices and principles learned in the classroom and to develop new skills and abilities (Newcomb et al., 1986). When all of these components have their place in career centers based on supervision, practice, and experience, teachers can successfully apply them while attaining students' vocational/career goals and benefits.

> Research Question 14: Could certain demographic characteristics of Michigan agriscience teachers be identified as predictors of factors affecting students' involvement with SAE programs?

When all 12 independent variables were included using the stepwise regression method at the .1 alpha level, demographic characteristic career center, as one of high school

types in which agriscience teachers taught, was found to be a significant positive predictor of factors affecting students' involvement with SAE programs. Thus, teachers who worked in career centers had higher perceptions of factors affecting students' involvement with SAE programs. As mentioned in question 12, the philosophy behind SAE programs is experiential learning or learning by doing. Consequently, SAE programs are affected by several factors for applying learning by doing principle. Those factors may be more touched for agriscience teachers in career centers than in other types of high schools.

> Research Question 15: Could certain demographic characteristics of Michigan agriscience teachers be identified as predictors of teachers' perceptions of the necessity of SAE programs?

When all 12 independent variables were included using the stepwise regression method at the .1 alpha level, the demographic characteristic gender was found to be a significant negative predictor of the necessity of SAE. Thus, according to the numerical values assigned to the two gender groups (male=1, female=2), female agriscience teachers were less likely to perceive the necessity of SAE programs. As mentioned in the discussion of Question 12, female teachers of agriscience were found to have less teaching experience, less scheduled time spent on teaching agriscience, and fewer students enrolled in agriscience than their male counterparts. Thus, female teachers with these characteristics perhaps did not recognize the importance and necessity of SAE programs like male teachers did. These characteristics can affect the agriscience teachers' role in agriscience generally and in SAE specifically. With regard to female teachers of agriscience, Knight (1987) found that female teachers of agriscience in Ohio had no experience as agriscience students, had an average of four years of teaching experience, spent four hours per week on SAE programs, and were

interested in pursuing advanced degrees in agriscience. Cano and Miller (1987) found that female teachers of agriscience were significantly younger and had significantly fewer years of teaching experience than male teachers, but these characteristics were not significantly related to their overall job satisfaction.

> Research Question 16: Could certain demographic characteristics of Michigan agriscience teachers be identified as predictors of the percentage of students who have SAE programs?

When all 12 independent variables were included using the stepwise regression method at the .1 alpha level, the best model consisted of the demographic characteristics, comprehensive high school, gender, and years of teaching agriscience. These three variables were found to be significant predictors of the percentage of students who had SAE programs. Whereas the variables comprehensive high school and gender were found to be significant negative predictors, the variables years of teaching agriscience was found to be a significant positive predictor of the percentage of students in SAE programs. Thus, teachers who worked in comprehensive high schools and female teachers had a lower percentage of students with SAE programs. On the other hand, the more years teaching agriscience, the higher the percentage of students with SAE programs. Regarding the amount of the variance explained by each variable separately, the variable of comprehensive high school explained 8.1%, gender explained 4.9%, years of teaching explained 3.8% of the variance in teachers' perception of percentage of students who had SAE programs. Because female agriscience teachers were found to have less teaching experience, less scheduled time spent on teaching agriscience, and fewer students enrolled in agriscience, perhaps they were not able to help students be involved with SAE programs like male teachers were. In addition, the nature of

SAE programs is different from those of other majors or programs in science. SAE programs to be successfully conducted and developed, need planning, decision making, supervision and visitations, and cooperation among the teacher, student, employer, and parents. These tasks and others need experience to be developed. For example, SAE supervision occurs in instructional visitations with students at home, with the employer and students at the place of employment, and working individually with students to set goals and resolve problems (Barrick et al., 1992). Male agriscience teachers seemed to perform these tasks more easily than female teachers.

Concerning comprehensive high schools, their having a significant negative relationship with the percentage of students who had SAE programs could be logical when it is compared with other types of high schools such as career centers and high schools that are designated career centers regarding agriscience program generally and SAE programs specifically. In comprehensive high schools, agriscience programs often are elective for students, have limited instructional time, and might not have enough facilities or projects for students to initiate and apply their SAE programs as is possible in career centers.

With respect to years of teaching, agriscience teachers with more teaching experience can recognize the importance of SAE and, consequently, help students be involved with SAE programs. So the positive relationship between years of teaching and percentage of students who had SAE could be logical. Michigan agriscience teachers in this study thought that teaching experience was one of several factors that affected students' involvement with SAE programs. Anyadoh and Barrick (1990) found that quality and size of SAE programs were significantly and positively related to the amount of time the teacher taught agriscience courses and years of experience. Grady (1985) found a significant difference in the job

satisfaction of agriscience teachers with varying amounts of teaching experience. As the number of years of teaching experience increased, job satisfaction also increased.

Conclusions

Based on the on the findings of this study, the following conclusions were drawn:

1. Michigan agriscience teachers philosophically indicated that SAE programs were found to be valuable, workable, supported, and promoted in Michigan agriscience programs. Several types of SAE programs were supported, such as ownership, placement, laboratory experience, improvement, exploratory, and supplementary skills. SAE programs also were found to be required for all students enrolled in agriscience programs.

2. Michigan agriscience teachers viewed SAE programs as being beneficial for agriscience students in several areas, such as solving problems, making decisions, self-learning, acceptance of responsibility, developing independence, motivation to learn and use of business procedures. SAE programs also were indicated to be useful in preparing for agricultural occupations, choosing an occupation, managing money, setting educational goals, helping students earn money while in school, encouraging record-keeping, and developing self-confidence.

3. Several factors were found to affect students' involvement with SAE programs. Some of these factors concerned areas related to agriscience teacher, such as teacher experience, teacher commitment, teacher success with SAE before entering teaching, teacher perceptions of necessary program characteristics, and teacher expectations of students. Some factors related to parental help and employer support also were found to affect student involvement in SAE programs. Other factors related to areas such as money available, school-land laboratory available, number of farms, student agricultural background, facilities

available, and students' participation in other activities. All these factors, according to Michigan agriscience teachers, affected students' involvement with SAE programs.

4. According to the teachers participated in this study, SAE programs were necessary for agriscience students. At the same time, Michigan agriscience departments did not require that all students enrolled in agriscience have SAE programs although teachers thought these programs should be required for all agriscience students. Generally, over 50% of Michigan agriscience students had SAE programs.

5. Michigan agriscience departments provided several facilities such as greenhouses, science labs, animal facilities, crop land, and tree nurseries in which to conduct SAE programs. At the same time, they did not provide enough agriscience projects for students to initiate their SAE programs. Also high schools that included agriscience programs did not provide most teachers with vehicles to be used for SAE visitations, but they compensated them for using their own cars. The above statements, except compensating teachers for use of their vehicles, were consistent with teachers' agreement with statements related to money, facilities, and school-land laboratory available for SAE programs. These factors have been found to affect students' involvement with SAE programs.

6. The majority of Michigan agriscience teachers conducted out-of-class work with students' SAE programs but in a small amount. They also indicated that they spent about one-half hour per visit in SAE visitation/supervision.

7. Michigan agriscience teachers expected the level of student involvement with SAE to increase in the future.

8. Several areas of assistance were currently provided in a "small" amount and should be provided in "some" amount by Michigan agriscience teachers. These areas related to

incentive for SAE programs, planning, parental agreement, long-range plans, budgets, financing, managing, keeping records, counseling, transportation, evaluation, and making decisions. Only in the area of "selecting the proper type of SAE programs," teachers currently provided some amount of assistance and indicated that they should provide the same amount.

9. This study indicated significant predicted relationships between some demographic characteristics of Michigan agriscience teachers their perceptions of certain aspects of SAE programs. Gender was found to be a significant negative predictor of teachers' philosophies toward SAE, perceptions of the necessity of SAE, and percentage of students who had SAE. Also, comprehensive high school, as the type of high school in which teachers worked, was found to be a significant negative predictor of the percentage of students who had SAE. The variable career center was found to be a significant positive predictor of benefits of SAE and factors affecting students' involvement with SAE programs. Also, teaching experience was found to be a significant positive predictor of the percentage of students who had SAE. Scheduled time spent on teaching agriscience also was found to be a significant positive predictor of teachers' philosophies regarding SAE and the percentage of students who had SAE programs.

Recommendations

Based on the findings and conclusions from this study, the following recommendations were developed:

1. SAE programs provide valuable learning opportunities for agriscience students, and agriscience teachers are responsible for motivating their students to conduct and develop strong SAE programs. Although Michigan agriscience teachers philosophically indicated that

they were confident about their abilities to help students conduct SAE programs, they indicated that helping every student is difficult and they had difficulties motivating students to conduct SAE programs. Agriscience teachers should make SAE programs serve as a motivational tool. When teachers introduce the concept of SAE to students, they should offer a thorough understanding of the SAE philosophy, how it relates to the agriscience program, and awareness of the career opportunities available to students. Teachers also, through SAE visitations, should praise students for their accomplishments.

2. Because agriscience students will work in their communities as an educated labor force, agriscience teachers should work with parents, employers, and teacher educators to develop a relationship between the SAE programs and local communities. This relationship should help teachers become acquainted with community needs and interests and, consequently, ensure positive community support of and attitudes toward SAE programs.

3. SAE programs involve several components such as establishing minimum requirements for SAE, supervising SAE, and evaluating SAE. To perform these components and others, agriscience teachers should be provided with written policies or plans as guidelines to use in directing SAE programs. Each student also should have a written plan for his or her SAE. That plan should be reviewed with students by agriscience teachers, parents, and employers.

4. One of the most interesting and challenging parts of the total agriscience program continuous to be SAE programs. Thus, Michigan agriscience departments should require all students enrolled in agriscience have SAE programs. Facilities, projects, and funds are essential elements for conducting, developing, and completing SAE programs. Adequate facilities, projects, and instructional materials should be provided to agriscience departments

and frequently to students and teachers. State supervisors of agriscience should facilitate providing funding support and resources for agriscience programs that include SAE as an integral part of the program. Travel funds and transportation should be provided to agriscience teachers to conduct SAE visitation/supervision.

5. The on-site visitations for SAE programs provide teachers with knowledge of students' progress and problems. Therefore, agriscience teachers should be given adequate time for visiting and supervising SAE programs. The visits should be carefully planned, prepared, and arranged in advance with the students. Agriscience teachers should pay more attention to beginning students by offering them additional on-site visitations/supervision and to students with SAE problems by visiting them promptly and frequently.

6. Much of the potential for successful SAE programs resides with agriscience teachers. These teachers play a critical role in planning, selecting, developing, financing, managing, counseling SAE programs. They also participate in developing long-range plans for SAE, keeping records, and developing parental agreement. Therefore, they should give more attention to the amount of assistance that they currently provide and that they should provide the above mentioned areas.

7. SAE programs that are applied in comprehensive high schools should be given more attention by the school district by providing facilities and equipment, labs, transportation, and enough time for agriscience teachers to conduct SAE visitation/supervision.

8. Finally, teacher education in agriscience represents the first place in which agriscience teachers are prepared. Thus, teacher education program should:

a. Present the curriculum that includes a theoretical background about the nature and purpose of SAE and the basic principles applied through SAE programs.

b. Help teacher education students in agriscience visit schools that apply SAE programs and participate in conducting, developing, and supervising SAE programs.

c. Prepare and facilitate in-service education programs on SAE for agriscience teachers in the state. These in-service programs can acquaint teachers with the changes that constantly are taking place in SAE programs. In-service programs also can familiarize teachers with the new technologies and agricultural practices to be applied in the agriscience program generally and in SAE specifically.

d. Conduct orientations and meetings for school personnel, students, parents, and employers to acquaint them with the role of SAE in agriscience programs and how they can cooperate with each other in conducting and supervising SAE programs.

Suggestions for Further Studies

Based on the findings, conclusions, and recommendations from this study, the following suggestions are made for further studies:

1. Similar studies need to be conducted regarding other subjects, parents and employers, to determine their perceptions of SAE programs in Michigan.

2. Factors affecting students' involvement and participation in SAE programs in Michigan need to be investigated.

3. Studies need to be conducted on agriscience departments' policies and functions with regard to SAE programs.

4.The effectiveness of SAE visitation/supervision in Michigan agriscience programs needs to be studied and investigated.

APPENDICES

APPENDIX A

UNIVERSITY COMMITTEE FOR RESEARCH INVOLVING HUMAN SUBJECTS

MICHIGAN STATE
UNIVERSITY

April 1, 1997

TO: Frank Bobbitt
409 C Agriculture Hall

RE: IRB#: 97-170
TITLE: MICHIGAN AGRISCIENCE TEACHERS' PERCEPTIONS OF SUPERVISED AGRICULTURAL EXPERIENCE PROGRAMS
REVISION REQUESTED: N/A
CATEGORY: 1-C
APPROVAL DATE: 03/31/97

The University Committee on Research Involving Human Subjects'(UCRIHS) review of this project is complete. I am pleased to advise that the rights and welfare of the human subjects appear to be adequately protected and methods to obtain informed consent are appropriate. Therefore, the UCRIHS approved this project and any revisions listed above.

RENEWAL: UCRIHS approval is valid for one calendar year, beginning with the approval date shown above. Investigators planning to continue a project beyond one year must use the green renewal form (enclosed with the original approval letter or when a project is renewed) to seek updated certification. There is a maximum of four such expedited renewals possible. Investigators wishing to continue a project beyond that time need to submit it again for complete review.

REVISIONS: UCRIHS must review any changes in procedures involving human subjects, prior to initiation of the change. If this is done at the time of renewal, please use the green renewal form. To revise an approved protocol at any other time during the year, send your written request to the UCRIHS Chair, requesting revised approval and referencing the project's IRB # and title. Include in your request a description of the change and any revised instruments, consent forms or advertisements that are applicable.

PROBLEMS/ CHANGES: Should either of the following arise during the course of the work, investigators must notify UCRIHS promptly: (1) problems (unexpected side effects, complaints, etc.) involving human subjects or (2) changes in the research environment or new information indicating greater risk to the human subjects than existed when the protocol was previously reviewed and approved.

If we can be of any future help, please do not hesitate to contact us at (517)355-2180 or FAX (517)432-1171.

Sincerely,

David E. Wright, Ph.D.
UCRIHS Chair

DEW:bed

cc: Mohamed H. Hendy

APPENDIX B

SURVEY INSTRUMENT

Dear: Michigan Agriscience Teacher

Michigan is one of the leaders in agriscience education. One of the important areas of agriscience is the supervised agricultural experience (SAE) programs. SAE programs consist of planned and practical activities usually conducted outside of scheduled class time in which students develop and apply agricultural knowledge and skills.

It is apparent that there are various ideas and opinions about SAE programs and their characteristics from state to state. This study tries to determine perceptions of Michigan agriscience teachers regarding SAE programs. The study will not be an evaluation of your program but only a review of your perceived ideas and opinions in respect to some aspects and characteristics of SAE programs.

You indicate your voluntary agreement to participate by completing and returning this questionnaire. Your responses will be treated with complete confidentiality and you will remain anonymous in any report of research findings. Only aggregate reports will be made, so no report will enable anyone to identify an individual's response(s).

Because we are sure that your opinions will be useful to assess the status of SAE in the Michigan agriscience program, it will be helpful if you take just a few minutes to complete the questionnaire by answering all the questions provided. A self addressed and stamped return envelop has been provided for your convenience. Once you have completed the questionnaire, place it in the envelope and return it immediately.

Thank you in advance for taking time to complete this questionnaire.
Sincerely,

Questionnaire

Michigan Agriscience Teachers' Perceptions of Supervised Agricultural Experience Programs

Directions:

This questionnaire was prepared to determine your perceptions of selected aspects of SAE programs. Through the first three sections, read each statement carefully and indicate the extent to which you agree or disagree by circling a response from the scale shown to the right of each statement.

- If you firmly disagree (FD), circle 1
- If you disagree (D), circle 2
- If you slightly disagree (SD), circle 3
- If you slightly agree (SA), circle 4
- If you agree (A), circle 5
- If you firmly agree (FA), circle 6

(I) Teacher philosophy.	FD	D	SD	SA	A	FA
1. SAE is a valuable component of agriscience program.	1	2	3	4	5	6
2. I am supportive of the SAE concept in agriscience.	1	2	3	4	5	6
3. The SAE concept is not workable in today's agriscience.	1	2	3	4	5	6
4. I promote SAE programs in my agriscience classes.	1	2	3	4	5	6
5. Extra class credit should not be provided for students completing SAE programs.	1	2	3	4	5	6
6. I often use real problems encountered by students in their SAE programs.	1	2	3	4	5	6
7. Agriscience teachers should not establish minimum standards for the scope of individual SAE programs.	1	2	3	4	5	6
8. Helping every student plan and conduct a SAE program is difficult.	1	2	3	4	5	6
9. I have difficulties motivating students to conduct SAE programs.	1	2	3	4	5	6
10. Every SAE program should include ownership, placement, or laboratory experience.	1	2	3	4	5	6
11. Improvement, exploratory, or supplementary skills should not be a part of SAE programs.	1	2	3	4	5	6
12. Agriscience students should not be required to conduct SAE programs.	1	2	3	4	5	6
13. I am confident in my ability to help students carry out SAE programs.	1	2	3	4	5	6
14. SAE programs should be planned with a potential for profit.	1	2	3	4	5	6

(II) Benefits of SAE programs.	FD	D	SD	SA	A	FA
1. SAE programs promote acceptance of responsibility.	1	2	3	4	5	6
2. SAE programs do not develop self-confidence.	1	2	3	4	5	6
3. SAE programs provide opportunity for self learning.	1	2	3	4	5	6
4. SAE programs develop independence.	1	2	3	4	5	6
5. SAE programs provide opportunity to make decisions.	1	2	3	4	5	6
6. SAE programs provide opportunity to solve problems.	1	2	3	4	5	6
7. SAE programs provide motivation to learn.	1	2	3	4	5	6
8. SAE programs encourage record-keeping.	1	2	3	4	5	6
9. SAE programs help make agriscience practical.	1	2	3	4	5	6
10. SAE programs do not help students earn money while in school.	1	2	3	4	5	6
11. SAE programs do not help set education goals.	1	2	3	4	5	6
12. SAE programs develop ability to manage money.	1	2	3	4	5	6
13. SAE programs help prepare for agricultural occupations.	1	2	3	4	5	6
14. SAE programs encourage use of business procedures.	1	2	3	4	5	6
15. SAE programs do not aid in choosing an occupation.	1	2	3	4	5	6

(III) Factors affecting student involvement in SAE programs.	FD	D	SD	SA	A	FA
1. Money available for students to finance SAE programs.	1	2	3	4	5	6
2. Parent abilities to help with financing SAE programs.	1	2	3	4	5	6
3. Facilities available for SAE programs.	1	2	3	4	5	6
4. Student participation in activities other than sports is excessive.	1	2	3	4	5	6
5. School-land laboratory available for student use.	1	2	3	4	5	6
6. Agriscience teacher experience.	1	2	3	4	5	6
7. Community attitudes about SAE programs.	1	2	3	4	5	6
8. The agricultural background of students.	1	2	3	4	5	6
9. The decline in the number of farms.	1	2	3	4	5	6
10. Agriscience teacher perceptions of necessary program characteristics.	1	2	3	4	5	6
11. Agriscience teacher commitment to SAE programs.	1	2	3	4	5	6
12. Employer support.	1	2	3	4	5	6
13. Teacher success with SAE programs prior to entering teaching process.	1	2	3	4	5	6
14. Size of community.	1	2	3	4	5	6
15. Students dislike maintaining SAE program records.	1	2	3	4	5	6
16. Teacher expectations of students.	1	2	3	4	5	6

(IV) Necessity of SAE programs.

Do you feel that SAE programs are necessary for agriscience students?

(Check one) ____Yes ____No

(V) Agriscience departments' policies toward SAE programs.

1. Does your department have a written policy outlining SAE program requirements which your students must fulfill? (Check one) ____Yes ____No
2. Does your department require all students enrolled in agriscience program have a SAE program? (Check one) ____Yes ____No
3. What percentage of a student's grade is dependent upon his/her involvement in a SAE program? (Check one) ___0 ___10 ___20 ___30 ___40 ___50 _____Other
4. What percentage of students have SAE programs? _____%
5. What percentage of students have the following different types of SAE programs?

Ownership _____% Placement_____% Laboratories_____%

Improvement____ % Exploratory_____% Supplementary_____%

(VI) Agriscience departments' functions toward SAE programs.

1. Does the school provide the following facilities for the students to conduct their SAE programs. (Check one)

	Yes	No
Greenhouse	____	____
Animal facilities	____	____
Crop land	____	____
Science Lab	____	____
Tree nursery	____	____
Others (specify)—	____	____
_____	____	____

2. Does your agriscience program provide some type of project, such as an animal chain, in which students might initiate or participate in a SAE program? (Check one) ____Yes ____No
3. Does the school provide you with a vehicle to be used for SAE program visitations? (Check one). If no, go to #4 ____Yes ____No
4. Does the school compensate for use of your car. (Check one) ____Yes ____No

(VII) SAE visitations.

1. Approximately what percentage of your out-of-class work is spent supervising student SAE programs? _____%
2. What is the average (approximate) amount of time spent with the students' SAE program per visit? _____ Minutes.

(VIII) Teacher planned emphasis of student involvement with SAE programs in the future.

In the future, do you plan to increase, decrease, or maintain the level of involvement of your students with SAE programs? (Check one)

____Increase ____Maintain ____Decrease

(IX) Teacher assistance to students.

Indicate in the scale below: a) the amount of assistance you feel that you provide to students' SAE programs and b) the amount of assistance you feel that you should provide. For great amount, circle 1, for large amount, circle 2, for some amount, circle 3, for small amount, circle 4, and for non-amount of assistance, circle 5.

AREA	Assistance Currently Provided					Assistance Should be Provided				
	None	*Small*	*Some*	*Large*	*Great*	*None*	*Small*	*Some*	*Large*	*Great*
1. Development of incentive for SAE programs.	1	2	3	4	5	1	2	3	4	5
2. Planning of SAE programs.	1	2	3	4	5	1	2	3	4	5
3. Selecting the proper type of SAE programs.	1	2	3	4	5	1	2	3	4	5
4. Developing parental agreement.	1	2	3	4	5	1	2	3	4	5
5. Developing long-range plans for SAE programs.	1	2	3	4	5	1	2	3	4	5
6. Developing budgets for SAE programs.	1	2	3	4	5	1	2	3	4	5
7. Financing SAE programs.	1	2	3	4	5	1	2	3	4	5
8. Managing SAE programs.	1	2	3	4	5	1	2	3	4	5
9. Keeping records for SAE programs.	1	2	3	4	5	1	2	3	4	5
10. Providing counseling on reinvestment of profit.	1	2	3	4	5	1	2	3	4	5
11. Providing transportation for SAE activities.	1	2	3	4	5	1	2	3	4	5
12. Evaluating SAE programs.	1	2	3	4	5	1	2	3	4	5
13. Making general decisions.	1	2	3	4	5	1	2	3	4	5
14. Others (specify) ----------	1	2	3	4	5	1	2	3	4	5
----------	1	2	3	4	5	1	2	3	4	5

DEMOGRAPHICS

1. Age: ____

2. Gender: (check one) Male ____ Female_____

3. Highest degree completed. (Check one) Bachelor____ Master____ Specialist____

Ph D ____ Other ____

4. Number of years teaching : _____

5. Area of emphasis in agriscience: (check one) Agriscience____ Landscape____

Greenhouse____ Agricultural Mechanics____

Floriculture____ Other (specify)_____

6. Percent of scheduled teaching time spent on agriscience teaching every day_____

7. Number of students enrolled in your high school _____

8. Number of students enrolled in agriscience classes _____

9. Do you teach in a: (check one)

a._____ Comprehensive high school
b._____ Career center
c._____ Comprehensive high school that is designated career center

APPENDIX C

THE JURY COMMITTEE
MEMBERS OF THE SURVEY INSTRUMENT

Jury Committee Members

1. Frank Bobbitt, Professor
   Dept. of Agricultural & Extension Education
   Michigan State University

2. Eddie Moore, Professor
   Dept. of Agricultural & Extension Education
   Michigan State University

3. Dave Krueger, Assistant Professor
   Dept. of Agricultural & Extension Education
   Michigan State University

4. Randy Showerman, Professor
   Dept. of Agricultural & Extension Education
   Michigan State University

5. Richard Karelse, Consultant
   Program Development & Operation Unit
   Michigan Department of Education

6. Dennis Duncan, Professor
   Dept. of Agricultural & Extension Education
   Michigan State University

7. Cary Trexler, Graduate Assistant
   Dept. of Agricultural & Extension Education
   Michigan State University

APPENDIX D

FIRST COVER LETTER

STATE OF MICHIGAN

DEPARTMENT OF EDUCATION

Office of Career and Technical Education
Box 30009, Lansing, Michigan 48909-7509

March 17, 1997

Dear Michigan Agriscience Teachers:

Ten years ago teachers were surveyed in an attempt to determine the status of Agricultural Education in Michigan. Since that time many changes have taken place. It is now time to reexamine some of the key components of the program to determine the status in 1997.

The enclosed survey instrument is an attempt to determine the status of SAE in the Michigan Agriscience program. Your answers can assist us with a better understanding of how the changes in the program have affected this important aspect of the program.

Please complete the instrument and return it as soon as possible.

Sincerely,

Richard Karelse, Consultant
Program Development & Operation Unit

Frank Bobbitt, Professor
Department of Agr'l & Ext Education
Michigan State University

FB/dld

Mohamed Hendy

Mohamed Hendy, Ph. D Candidate
Department of Agr'l. & Ext. Education
Michigan State University

APPENDIX E

SECOND COVER LETTER

MICHIGAN STATE
UNIVERSITY

April 7, 1997

Dear Michigan Agriscience Teacher

Two weeks ago, we sent you a questionnaire concerning supervised agricultural experience (SAE) programs. Many Agriscience teachers have returned their surveys. If you have already completed and returned it, please accept our sincere thanks. If you have not yet returned your form, we are enclosing a second copy for your convenience. Please assist us by completing the enclosed form and returning it in the enclosed envelope.

The return of your completed questionnaire is very important in order to assess the status of supervised agricultural experience programs in Michigan Agriscience Program.

Thank you for helping us to complete the study.

Sincerely,

Frank Bobbitt

Mohamed Hendy

Frank Bobbitt, Professor
Department of Agr'l. & Ext. Education
Michigan State University

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APPENDIX F

THIRD COVER LETTER

MICHIGAN STATE
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April 21, 1997

Dear Michigan Agriscience Teacher

Four weeks ago, we sent you a questionnaire concerning supervised agricultural experience (SAE) programs. Two weeks later, on April 7, 1997, we sent a second copy of the questionnaire. Many Agriscience teachers have returned their surveys. If you have already completed and returned it, please accept our sincere thanks. If you have not yet returned your form, we are enclosing a third copy for your convenience. Please assist us by completing the enclosed form and returning it in the enclosed envelope.

The return of your completed questionnaire is very important in order to assess the status of supervised agricultural experience programs in Michigan Agriscience Program.

Thank you for helping us to complete the study.

Sincerely,

Frank Bobbitt

Mohamed Hendy

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