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**A STUDY OF THE AGRICULTURAL COMPETENCIES OF SENIOR
VOCATIONAL AGRICULTURE STUDENTS IN MICHIGAN BASED ON THEIR
SUPERVISED OCCUPATIONAL EXPERIENCE PROGRAMS**

Michigan State University

Ph.D. 1983

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VOCATIONAL AGRICULTURE STUDENTS IN MICHIGAN
BASED ON THEIR SUPERVISED OCCUPATIONAL
EXPERIENCE PROGRAMS

By

Daryoush Shahrokh

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirement
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Education Institute

1983

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CHAPTER I

THE PROBLEM AND ITS SETTING

Introduction

The Supervised Occupational Experiences (S.O.E.) program as a vital part of the total program of agribusiness and natural resources education, had its origins in the Smith-Hughes Act of 1917, which stated ". . .the school shall provide for directed or supervised practice in agriculture either on a farm provided for by the school or other farm, for at least six months per year" (Phipps, 1972, p. 578). As a result of this legislation and the belief that supervised experience is essential if the program is to be vocational, the S.O.E. program became an important part of the vocational curriculum. S.O.E. programs are defined as the performance by students, of the tasks required in agricultural occupations for which systematic instruction and supervision are provided, gives opportunities to learn through actual performance of tasks in a work setting (Phipps, 1972).

Calhoun and Finch (1976, p. 213) suggested that contemporary vocational agriculture programs should focus on:

- a) preparation and advancement in any occupation involving knowledge and skill of agriculture, b)
- occupational experiences guidance, and counseling and
- c) development of abilities essential for effective citizenship.

Pursuant to the accomplishment of these goals, vocational agriculture programs had been designed with three main parts, classroom and

laboratory instruction, supervised occupational experience, and F.F.A. activities. However, several researchers reported that less emphasis had been placed on S.O.E. programs at that time in vocational agriculture schools in the state of Michigan, although vocational agriculture educators agreed that the S.O.E. programs were necessary for an agriculture program to be truly vocational in nature. Further, although a variety of S.O.E. Programs had been developed, there was little evidence of which type was most effective. An exhaustive review of professional literature revealed that no related studies had been made in Michigan, such as Garner's study, (Garner, 1951).

This study was undertaken with a view that senior vocational agriculture students could benefit from S.O.E. programs. One of the universal techniques to assure attentiveness and participation is to provide programs in which the students have indicated an interest and especially those that provide identified agricultural competencies they need.

Statement of the Problem

Learning by doing is an educational principle that has shaped vocational agriculture education for over sixty years in the United States. It has been applied through various learning methods. The S.O.E. program is one method used in vocational agriculture to extend formal education to agribusiness, farms and other sites of agricultural activity, where students apply their skills and develop new competencies in agriculture under the supervision of parents, employers, and teachers.

Students in various types of S.O.E. programs (a) farm or agribusiness placement, (b) school land laboratories, (c) home farm production), who reside in various places are enrolled in vocational agriculture. Such differences among students should be considered in developing S.O.E. programs to provide students with individualized learning in agriculture. A knowledge of how students with different types of S.O.E. programs and places of residence perceive the importance of their S.O.E. program in developing agricultural competencies is needed to provide a basis for developing improved vocational agriculture S.O.E. programs and supportive curriculum.

This study is designed to identify the relationship between: 1) students involved in production agriculture in S.O.E. programs that focus on (a) farm or agribusiness placement, (b) school land laboratories, or (c) home farm production and those students' places of residence: (a) on a farm, or (b) in a town or non-farm area; and 2) the agricultural competencies attained by these students as measured through specified performance objectives in production agriculture.

Need for the Study

Since the passage of the Smith-Hughes Act in 1917, the responsibilities and duties of the teacher of vocational agriculture have increased tremendously (Morris, 1956). This, along with changes in society and the school curricula, have increased the need for well organized S.O.E. programs, if the teacher is to prepare students to successfully enter and advance in agricultural occupations. A variety of such programs have been established and there is a need to identify

the most effective of these programs in the state of Michigan.

The student enrollments in secondary vocational agriculture programs in Michigan have been consistently large over the last four academic years for which data are available: 14,424 students in 1975-76; 14,916 in 1976-77; 14,406 in 1977-78; and 14,616 in 1978-79 (Michigan Department of Education, 1979). Continuing enrollment figures of this magnitude especially with declining overall school enrollments, justifies continuing to prepare and improve effective S.O.E. programs for Michigan vocational agriculture students.

The Supervised Occupational Experience program should be a vital and integral part of the instructional program. Since only one research study had been made in the past 30 years, there was a need for research to determine which types of S.O.E. programs are most effective. Effectiveness is demonstrated through evidence of a positive relationship between S.O.E. programs and learning achievement.

The researcher located three studies that investigated the relationship between Supervised Occupational Experience and learning achievement (Christensen, 1966; Cushman, 1968; and Neanill, 1979). However, an extensive search of the literature revealed no research studies in vocational agriculture in Michigan that examined the relationship between: 1) the quality of various types of S.O.E. programs and 2) student achievement in technical knowledge related to agriculture.

Supervised Occupational Experiences programs have been an important component of vocational agriculture education since 1917.

National leaders in vocational education, such as Hamlin, Deyoe, Hammond, Phipps, Williams, and Binkley, have written much over the years to support and expand the concept of occupational work experience in agriculture. However, since the Vocational Education Act of 1963, less emphasis had been given to the S.O.E. component of the program.

Binkley (1977), after a tour of vocational agriculture developments in various states in 1975, expressed concern that S.O.E. programs had decreased to a low level. Other researchers, such as Lawrence, 1981; Garner, 1976; Mallilo, 1979; and Norris, 1975, have attempted to identify S.O.E. program problems and strengths through a determination of preservice and inservice needs expressed by vocational agriculture teachers.

In Michigan, there was a need to determine which general type of S.O.E. program is most helpful to students in developing desirable agricultural competencies; i.e., S.O.E. programs that focus on a) farm or agribusiness placements, b) school land laboratories, or c) home farm production. Further, there was a need to determine what impact the students' place of residence had on the development of desirable agricultural competencies (i.e. farm or nonfarm area). Finally, there was a related need to compare students' attitudes toward the world of work and the focus of S.O.E. programs in one of the following; a) farm or agribusiness placement, b) school land laboratories, or c) home farm production programs.

Students with diverse educational and occupational plans, types of S.O.E. programs, and places of residence are enrolled in vocational agriculture (Byler, 1976). Such differences among students should be

considered in developing S.O.E. programs, to provide students with individualized learning in agriculture. A knowledge of how students with different characteristics perceive the importance of their S.O.E. program in developing agriculture competencies, and a knowledge of the importance of student involvement in various types of S.O.E. program factors are needed to provide a basis for further developing vocational agriculture, the S.O.E. programs and supportive curriculum materials.

Finally, a need exists for any study which purports to shed light on improving the effectiveness of teachers of vocational agriculture. Research conducted by Williams (1977) showed that help given students by vocational agriculture teachers was among the top five factors that influence students' S.O.E. programs. In the present study it was noted that many senior students in vocational agriculture programs are in a position to obtain meaningful information about their experiences themselves, which is also relevant to their career aspirations in agriculture. Such information and experiences can be provided by teachers and parents of vocational agriculture students through S.O.E. programs.

There are no available survey results of vocational agriculture teachers' and students' development needs in the S.O.E. programs, which could be of help in planning such programs at a state level. Current literature indicates that the identification and use of needs information in planning S.O.E. programs are essential elements of professional development. The S.O.E. programs have been accepted as beneficial to vocational agriculture teachers and those students who are enrolled in the S.O.E. programs.

Purpose of the Study

The main purpose of this study was to compare perceived educational competencies of vocational agriculture students enrolled in a production agriculture program and 1) Involved in an S.O.E. program that focuses on: a) farm or agribusiness placement program; b) school land laboratories; or c) home farm production in the state of Michigan, 2) The students' place of residence, a) on a farm, or, b) in a town, city or non-farm area.

The secondary purpose of this study was to analyze relationships between these perceived educational competencies and various attitudes of the students. It is the researcher's opinion that this information will be helpful to vocational agricultural teachers in planning and developing S.O.E. programs in the state of Michigan.

Objectives of the Study

The specific objectives of this research study are the following:

1. To identify the type of S.O.E. programs in which Michigan 1981-82 senior vocational production agriculture students participated.
2. To identify the place of residence of Michigan 1981-82 senior vocational agriculture students who were enrolled in production agriculture and participated in a S.O.E. program.
3. To identify 1982-83 senior students in Michigan, who were enrolled in vocational agriculture (production agriculture), and determine their perceptions of their own competence in selected technical areas.
4. To obtain a description of the secondary vocational agriculture department land laboratories in the survey sample.
5. To obtain a description of the focus of the S.O.E. program of each of the 1981-82 Michigan senior secondary vocational

agriculture students enrolled in a production agriculture program.

6. To determine vocational agriculture teachers' assessment of each of the Michigan 1981-82 seniors enrolled in secondary vocational (production) agriculture, regarding:
 - a. The ability of the student to get along with others,
 - b. The probability of the students' success in the world of work.
7. To determine if there is a difference between the perceived agricultural competencies of Michigan 1981-82 senior agricultural students in production agriculture and the major focus of the S.O.E. programs in which the students participated:
 - a. Farm or agribusiness placement
 - b. School land laboratories, or
 - c. Home farm production.
8. To determine if there is a difference between the perceived agricultural competencies of Michigan 1981-82 senior vocational agriculture students in production agriculture and the place of residence of students:
 - a. On a farm, or
 - b. In a town, city or nonfarm area.

Research Hypotheses

As discussed above, the main purposes of this study are to:

1. Compare students' perceived competencies in production agriculture, according to their S.O.E. programs, that focus on one of the following, as indicated by their teachers:
 - a. Farm or agribusiness placement,
 - b. School land laboratories, or
 - c. Home farm production.
2. Determine the impact of students' place of residence on the development of desirable agricultural competencies:

- a. On a farm, or
 - b. In a town, city or non-farm area; and
3. Compare students' attitudes toward the world of work and the focus of their S.O.E. programs, as indicated by their teachers:
- a. Farm or agribusiness placement program,
 - b. School land laboratories, or
 - c. Home farm production.

In accord with these objectives, the following hypotheses and corresponding null hypotheses are tested in this research:

Hypothesis 1

H_1 : Michigan 1981-82 senior vocational agriculture students in production agriculture, whose S.O.E. programs focused on school land laboratories, will have a higher level of perceived competence in production agriculture than those whose S.O.E. program focused on home farm production.

H_0 : Michigan 1981-82 senior vocational agriculture students in production agriculture, whose S.O.E. programs focused on school land laboratories, will not have a higher level of perceived competence in production

agriculture than those whose S.O.E. programs focused on home farm production.

$$H_1: \mu_1 \geq \mu_2$$

$$H_0: \mu_1 < \mu_2$$

$$\alpha = .05$$

Hypothesis 2

H_1 : Michigan 1981-82 senior vocational agriculture students in production agriculture, whose S.O.E. programs focused on school land laboratories, will have a higher level of perceived competence in production agriculture than those whose S.O.E. programs focused on farm or agribusiness placement.

H_0 : Michigan 1981-82 senior vocational agriculture students in production agriculture, whose S.O.E. programs focused on school land laboratories, will not have a higher level of perceived competence in production agriculture than those whose S.O.E. programs focused on farm or agribusiness placement.

$$H_1: \mu_1 \geq \mu_2$$

$$H_0: \mu_1 < \mu_2$$

$$\alpha = .05$$

Hypothesis 3

H_1 : Michigan 1981-82 senior vocational agriculture students in production agriculture, whose S.O.E. programs

focused on home farm production, will have a higher level of perceived competence in production agriculture than those whose S.O.E. programs focused on farm or agribusiness placement.

H_0 : Michigan 1981-82 senior vocational agriculture students in production agriculture, whose S.O.E. programs focused on home farm production, will not have a higher level of perceived competence in production agriculture than those whose S.O.E. programs focused on farm or agribusiness placement.

$$H_1: \mu_1 \geq \mu_2$$

$$H_0: \mu_1 < \mu_2$$

$$\alpha = .05$$

Hypothesis 4

H_1 : Michigan 1981-82 senior vocational agriculture students in production agriculture, whose place of residence is a town, city or other non-farm area, will have a higher level of perceived competence in production agriculture than those whose place of residence is a rural farm.

H_0 : Michigan 1981-82 senior vocational agriculture students in production agriculture, whose place of residence is a town, city or other, non-farm area, will not have a higher level of perceived competence in production agriculture than those whose place of residence is a rural farm.

$$H_1: \mu_1 \geq \mu_2$$

$$H_0: \mu_1 < \mu_2$$

$$\alpha = .05$$

Hypothesis 5

H_1 : Michigan 1981-82 senior vocational agriculture students in production agriculture, whose S.O.E. programs focused on home farm production, will have a higher level of positive attitudes toward work and workers than those whose S.O.E. programs focused on school land laboratories.

H_0 : Michigan 1981-82 senior vocational agriculture students in production agriculture, whose S.O.E. programs focused on home farm production will not have a higher level of positive attitudes toward work and workers than those whose S.O.E. programs focused on school land laboratories.

$$H_1: \mu_1 \geq \mu_2$$

$$H_0: \mu_1 < \mu_2$$

$$\alpha = .05$$

Hypothesis 6

H_1 : Michigan 1981-82 senior vocational agriculture students in production agriculture, whose S.O.E. programs focused on farm or agribusiness placement programs, will have a higher level of positive attitudes toward work and workers than those whose S.O.E. programs have focused on school land laboratories.

H_0 : Michigan 1981-82 senior vocational agriculture students in production agriculture, whose S.O.E. programs focused on farm or agribusiness placement programs, will not have a higher level of positive attitudes toward work and workers than those whose S.O.E. programs focused on school land laboratories.

$$H_1: \mu_1 \geq \mu_2$$

$$H_0: \mu_1 < \mu_2$$

$$\alpha = .05$$

Hypothesis 7

H_1 : Michigan 1981-82 senior vocational agriculture students in production agriculture whose S.O.E. programs focused on farm or agribusiness placement program will have more positive attitudes toward work and workers than those whose S.O.E. programs focused on home farm production.

H_0 : Michigan 1981-82 senior vocational agriculture students in production agriculture, whose S.O.E. programs focused on farm or agribusiness placement, will not have more positive attitudes toward work and workers than those whose S.O.E. programs focused on home farm production.

$$H_1: \mu_1 \geq \mu_2$$

$$H_0: \mu_1 < \mu_2$$

$$\alpha = .05$$

Assumptions

The following assumptions were made by the researcher in conducting this study.

1. It was assumed that the vocational agriculture teachers and their senior students who were included in the study sample would be willing to cooperate with the study by accurately filling out and returning the survey questionnaires.
2. It was assumed that all respondents in the study understood their roles as teachers or students of vocational agriculture and answered honestly.
3. It was assumed that all of the teachers included in the study were engaged in effectively teaching vocational agriculture and conducting S.O.E. programs.
4. It was assumed that the students selected to review the questionnaires for this study were qualified to identify their own perceived competencies in production agriculture.
5. It was assumed that the lists of competency statements randomly selected to represent the range of performance objectives were valid lists of important competencies for senior vocational students in production agriculture.
6. Research errors are random, independently and normally distributed about zero mean and with a common variance.

Limitations

It is recognized that this study has the following limitations:

1. This study focused on vocational agricultural teachers teaching agriculture in Michigan's comprehensive high schools and Michigan vocational agriculture students classified as seniors in production agriculture (01.0301) during the 1981-82 school year. It is possible that different conclusions may have been drawn from responses of instructors employed, or senior vocational agriculture students enrolled, during other time periods.
2. The findings of this study will be limited to the Michigan population of instructors and students described in this study.
3. Data were gathered during the 1981-82 school year and generalization to the current year or other periods may be limited by time considerations.

Definition of Terms

Certain terms relating to Supervised Occupational Experience programs are used rather frequently by professionals in vocational agricultural education. Since their meanings, as used in this study, may not be clearly understood by all readers of this report, the following definitions are the conceptualizations of the selected terms that were used throughout the study:

1. Vocational Education--A program of education below college level, organized to prepare the learner for entrance into a particular chosen vocation or to upgrade employed workers (Good, 1973, pp. 645).

2. Vocational Agriculture--Education in agriculture for persons engaged in, or expecting to engage in an agricultural occupation, either nonfarm or farm (Good, 1973, pp. 23).
3. Supervised Occupational Experience (S.O.E.) programs in Agriculture--All of the practical agriculture activities of educational value conducted by students outside of the formal classroom, for which systematic instruction and supervision are provided by their teachers, parents, employers or others (Phipps, 1972, pp. 185).
4. School Land Laboratory--A school land laboratory is an area operated by a school to instruct intensive observation and demonstration of the process of agriculture. According to Dr. H. Gardner (1982), "It provides opportunities for practical hands-on experiences for students who plan to work in or manage agribusinesses or farms." It is an area of land usually close to the school where approved practices may be tried out by students, and functions as a very effective aid for teachers, by strengthening and adding meaning to the students' experiences (Cook, 1963, p. 3).
5. Improvement Project--A project conducted by a student in vocational agriculture, not primarily for the purpose of an immediate or direct financial return, but to improve an agricultural business, either nonfarm or farm (Good, 1973, p. 451).
6. Home Farm Production Project--A phase of the S.O.E. program in vocational agriculture concerned principally with the

introduction of new farming practices and the acquisition of new farming skills, providing experience on the students' home farm, in addition to that afforded by other agricultural production and improvement projects.

7. Farm Placement programs--Farm placement provides educational opportunities for nonfarm students and those who do not have home farms adequate for developing the desired experiences in farming. Participating students are placed on local farms, and programs are developed in cooperation with the farm owners to provide practical learning experiences in farming, (Michigan Department of Education, 1972, p. 2).
8. Competency--Behavioral characteristics of knowledge, attitudes and judgment generally required for the successful performance of a task(s) or the sum total of attitudes, knowledge, and skills which enable a person to perform efficiently and effectively a given function (McClay, 1978, p. 7).
9. Agriculture Competencies--Agriculture competencies are those requiring attitudes toward, skills in and knowledge of animal science, plant science, soil science, agricultural mechanics, agribusiness, and farm and business management.
10. Rural Farm Population--As defined by the U.S. Census of 1970, all persons not part of the urban population and residing on farms of 10 or more acres from which the sales of farm products amounted to \$50 or more the previous year, or residing on farms of less than 10 acres from which such sales amounted to \$250 or more.

Summary and Overview

This study was implemented to:

1. Compare Michigan senior vocational agricultural competencies in production agriculture according to their S.O.E. programs, that focus on one of the following:
 - a. Farm or agribusiness placement
 - b. School land laboratories
 - c. Home farm production.
2. Determine the impact of Michigan vocational agriculture and the students' place of residence on the development of desirable agricultural competencies:
 - a. On a farm, or
 - b. In a town, city or non-farm area; and
3. Compare the Michigan vocational agriculture students' attitudes toward the world of work and workers and the focus of their S.O.E. program in a:
 - a. Farm or agribusiness placement
 - b. School land laboratory, or
 - c. Home farm production

Selected topics were discussed for the purpose of doing this survey study in Michigan.

Chapter two focuses on a review of the literature pertaining to: Importance of the S.O.E. Program in Vocational Agriculture, Purpose of S.O.E. Programs, Major Objectives of S.O.E. Programs, The Values of S.O.E. Programs, Importance of the Teacher in Conducting S.O.E.

Programs, Types of S.O.E. Programs, Supervised Farming Programs, Supervised Cooperative Farm Placement, Supervised Laboratory Program, Supervised Cooperative Agribusiness Program, Planning Supervised Occupational Experience Programs, and finally, Evaluation of S.O.E. Programs. Chapter three describes the Methodology used to conduct the research study. The findings of the study are discussed in chapter four. Chapter five is a summary of the study as well as conclusions and recommendations. Copies of correspondence with the Michigan vocational agriculture teachers and students are located in Appendix A. Appendix B contains a copy of the survey instruments. Tables showing Mean, Standard Deviation, and Analysis of Variables for the level of students' perceived competence in Production Agriculture (in 52 competencies): By the 1-Students' type of S.O.E. program, or 2-Students' Place of Residence are found in Appendix C. Tables showing Frequency and Percentage of Different Level of Students' Perceived Competence in Production Agriculture (In 52 competencies) based on 1-The Students' Place of Residence, and 2-Students' type of S.O.E. Program are found in Appendix D.

CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

Due to changes in the economy in Michigan, the United States and other regions of the world, professionals are engaged in revising and improving their educational systems. A basic concern underlying these efforts is to make education functional and relevant to the needs of the individual and of society. The researcher believed that educational systems are becoming increasingly isolated from the larger social, cultural and developmental goals of society. This isolation is further increased when the process of learning is separated from the performance of action and work, and is nowhere as visible as in the failure of education to provide youth and adults with an active comprehension of the world of work.

The response to this problem is reflected in a variety of programs utilized in the United States. One such program is the Supervised Occupational Experience (S.O.E.) program. The S.O.E. Program may be defined as a secondary vocational agriculture student's planned participation in one or more agricultural occupations. Some authors, such as David L. Williams (1977), may refer to such experience as a student's F.F.A. project. There are several kinds of S.O.E. programs which are additional to regular classroom activities. These include farm or agribusiness placement programs, school land laboratories, and

home farm production programs.

The major thrust of this chapter is to consider the literature pertinent to the scope of Supervised Occupational Experience programs in vocational agriculture departments in Michigan's secondary schools, by reviewing documents and other reports of research in this area.

The literature cited in this chapter is presented under the following headings:

The Importance of the S.O.E. Program in Vocational Agriculture, The Purpose of S.O.E. Programs, Major Objectives of S.O.E. Programs, The Values of S.O.E. Programs, The Importance of the Teacher in Conducting S.O.E. Programs, Types of S.O.E. Programs, Supervised Farming Program, Supervised Cooperative Farm Placement, Supervised Laboratory Program, Supervised Cooperative Agribusiness Program, Supervised Exploratory Program, Planning Supervised Occupational Experience Programs, and finally, Evaluation of S.O.E. Programs.

The Importance of the S.O.E. Programs in Vocational Agriculture

The Smith-Hughes Act of 1917 provided for the first national movement of vocational education in agriculture. As a result of this legislation, vocational agriculture has since become a significant program in many American secondary schools. This vocational education legislation has directed vocational agriculture in the preparation of students for entry into and achievement in agricultural occupations for over fifty years.

In 1963, new vocational education legislation was passed to improve and expand vocational opportunities throughout the United

States. This legislation challenged educators in vocational agriculture to prepare students for work in the occupational areas of agricultural production, agricultural supply/services, agricultural mechanics, agricultural products, horticulture, renewable natural resources, and forestry. Table 1 presents Michigan's demand (Expansion and Replacement needs), current supply, and projected supply from vocational education, for people in vocational agricultural education programs for the decade 1976-1987, 13 years after the new act was passed.

Through the years, S.O.E. programs in agriculture have proven to be an effective learning procedure for students. Farm practice, supervised practice, supervised farming programs, work experience programs, the Supervised Occupational Experience program and other terms had been used to refer to this type of learning experience. The S.O.E. program in agriculture included a planned series of learning experiences which were a part of the vocational agriculture program. It provided a means for students to participate actively in an agricultural occupation where they could apply agricultural knowledge and skills and develop additional competencies. Such experiences resulted in improved practices and facilities at the student's home, on a farm, at school, or in a community business. A student's supervised occupational experience would include some or all of the following types of experience, ownership, employment, or work-related responsibilities. Binkley, (1969, pp. 152-153) in describing the S.O.E. program stated that ". . .the foundation stone of the instructional programs are at the center of the battle; not a skirmish

Table 1
State Total Employment Opportunities Related to Vocational Education Programs*

OCCUPATIONAL TITLE	Expansion & Employ- ment in 1980	DEMAND & Replacement Needs Average Openings		CURRENT SUPPLY TOTAL	PROJECTED SUPPLIES from Vocational Education				
		1980-82	1976-85		1983	1984	1985	1986	1987
Agricultural Production				1,786	1,753	1,701	1,651	1,602	1,555
Agricultural Supply/service	5,530	150	340	25	24	23	22	21	20
Agricultural Mechanics	8,480	110	480	535	520	506	489	676	460
Agricultural Products	4,120	90	230	7	7	7	7	7	7
Horticulture	17,910	700	1,180	778	706	685	606	666	625
Renewable Materials	01.0700			291	286	281	876	271	266
Resources									
Forestry	2,600	30		102	71	70	69	68	67
Total			3,524	3,367	3,271	3,178	3,087	3,000	

*The Michigan Department of Education - "The Annual and Long Range State Plan for Vocational Education in Michigan." Lansing, Michigan. 1982. (p. 94).

on the fringe."

Cepica, (1977) described a study of a comparison of the summer program of Oklahoma vocational agriculture teachers' perceptions of selected activities in a summer program. The findings showed that teachers ranked working with high school students, working with prospective students, and F.F.A. activities as the three most important activities included in summer programs. In a study of the summer activities of Colorado teachers, Anderson (1962) reported the amount of time teachers spent on eleven categories of official school-connected activities. Included in these activities were the following:

F.F.A. activities	31.41%
Supervised Farming programs	17.63%
Professional Improvement	14.68%
Improving Physical Facilities	11.83%
Planning Next Year's program	9.03%
Developing Teaching Materials	4.08%
Contacting Students and Parents	8.73%
Performing Public Relations	3.56%
Correspondence, Records, Reports	2.70%
Community Activities	.99%
Out-of-School program	.48%

The Purpose of the S.O.E. Programs

The primary goal of vocational education in agriculture is to prepare students for occupations involving knowledge and skills in agriculture. Calhoun and Finch (1976, p. 213) stress that vocational

education at the secondary level is responsible for providing the skills necessary for job entry and suggest that contemporary programs in vocational education should emphasize:

a- preparation and advancement in any occupation involving knowledge and skills in agriculture; b- occupational exploration, guidance, and counseling; and c- development of abilities essential for effective citizenship.

The 1917 vocational education legislation (Smith-Hughes Act) prescribed practical experience in agriculture under the teacher's supervision as an integral part of the vocational agriculture curriculum. In 1933 Spanton (1933, p. 185) wrote that:

This attitude regarding the necessity for participating experience in vocational agriculture is psychologically sound, and can not be questioned by anyone who recognizes that the one big objective of a program of vocational education in agriculture is to develop ability, systematic training, and participating experience for greater proficiency in farming occupations.

In 1944, Ross and Climents (1944, p. 1), described an S.O.E. program as being an integral part and vital part of vocational agriculture, not an appendage, when they stated that ". . .such experience aids the individual student in developing abilities, acquiring skills, and solving real farming problems on his own level and should lead to a definite goal, satisfactory establishment in farming".

During the year in which the 1963 Vocational Education Act was passed, Thomson (1963, pp. 30-31), wrote that:

The primary purpose of a supervised program for a high school student enrolled in vocational agriculture is to provide experiences that will contribute to the development of the abilities needed for efficiency in

the type of work in agriculture in which the student is likely to engage. It provides an opportunity to develop deeper understanding through application of practice and principles in actual situations.

Phipps (1972, p. 62) stated that S.O.E. programs ". . .offer many opportunities for an instructor to do an effective job of supervision and teaching on the job." Cepica (1979), reported that a Texas study identified nine priority areas with regard to summer program activities. He listed these activity areas as follows:

1. Supervision of occupational experience programs,
2. Work with prospective new students,
3. Professional improvement,
4. Program planning,
5. Conducting Future Farmer of America (F.F.A) activities,
6. Adult and young farmer education,
7. Improving facilities and equipment,
8. Community service,
9. Records and reports.

In 1974, Bender and Taylor (1974), reported that a S.O.E. program should provide specialized educational experiences, aid in establishment in an agricultural occupation, and contribute opportunity for earning on the farm.

Major Objectives of the S.O.E. Program

A supervised occupational experience program is an integral part of a vocational education program in the secondary public schools and contributes to the general objectives of education. The experiences

provided contribute to the development of the student's ability to think and study, and to solve problems effectively, as well as to skill in collecting and interpreting data. According to Phipps (1972, p. 8), agricultural education programs in the secondary public schools also aid in the development of desirable attitudes and interests and in the development of social sensitivity and resourcefulness of students. He also believes that public school education in agriculture should attempt:

- 1- to develop the individuals as completely as possible.
- 2- to promote personal - group relationships with emphasis upon home and family life as fundamental to the individual's growth and to the public welfare.
- 3- to make individuals and groups responsive to the needs of other individuals and groups, of communities, of governments, and of other desirable social agencies.

Deoe (1943, pp. 18-26) stated that a Supervised Occupational Experience program should:

- 1. Provide experiences which contribute to the development of abilities needed for proficiency in farming of the type in which the student is likely to engage.
- 2. Provide a means for earning money.
- 3. Aid in progressive establishment in farming.
- 4. Lead to improvements in the Home-Farm business.
- 5. Lead to improved farming in the community.
- 6. Contribute to the attractiveness of farm homes and farm life.
- 7. Lead to increased interest in agriculture and in farming.
- 8. Aid in the development of attitudes and abilities of cooperation.
- 9. Provide TRY-OUT or exploratory experiences with certain phases of farming (pp. 18-26).

Bender and Taylor (1974), pointed out that the S.O.E. program should provide specialized educational experience, aid in establishment in an occupation, and contribute opportunities for earnings.

The current major program objectives established in 1965 by the U.S. Office of Education (1965, pp. 5-6), for secondary programs in vocational agriculture, are as follows:

1. To develop agricultural competencies needed by individuals engaged in or preparing to engage in production agriculture. . . .
2. To develop agricultural competencies needed by individuals engaged in or preparing to engage in agricultural occupations other than production agriculture. . . .
3. To develop an understanding of and appreciation for career opportunities in agriculture, and the preparation needed to enter and progress in agricultural occupations. . .
4. To develop the ability to secure satisfactory placement and to advance in an agricultural occupation through a program of continuing education.
5. To develop those abilities in human relations which are essential in agricultural occupations. . .
6. To develop the abilities needed to exercise and follow effective leadership in fulfilling occupational, social, and civic responsibilities. . .

According to Bishopp (1949), the major objectives of the S.O.E. programs in vocational agriculture programs were: (1) to learn by doing, (2) to develop a desire to cooperate, (3) to promote parent-school relationships, and (4) to provide occupational guidance. These objectives were written in 1949, but are consistent with current educational principles.

The Values of S.O.E. Programs

Some of the values of Supervised Occupational Experience programs in vocational agriculture, discussed in the literature are summarized below (Hammond, 1950; Peterson, 1973; Phipps, 1972):

1. Extends classroom instruction to the farm, laboratory, home or agribusiness.
2. Encourages use of approved practices.
3. Provides for development of occupational skills.
4. Promotes closer relationships between student and teacher.
5. Promotes cooperation between parents and teachers, and between teacher and agribusiness people.
6. Makes teaching effective in a real life situation.
7. Helps students see the relevance of instruction.
8. Gives students experiences in the business world.
9. Encourages students to learn to work with others.
10. Provides an avenue for students to grow into farming or other occupations requiring knowledge and skills in agriculture.
11. Provides opportunity to earn, save, and use money.
12. Provides motivation for learning and promotes interest in agriculture.
13. Develops pride of ownership or employment, initiative, self-confidence, and managerial ability.
14. Provides an opportunity for contributions to improvement of the home, farm and family living.
15. Allows students to recognize problems in farming or agribusiness jobs that can be solved in vocational

agriculture classes.

16. Enhances the effectiveness of F.F.A. activities.
17. Contributes to community improvement.
18. Develops opportunities for individualized instruction.
19. Provides a basis for evaluating the effectiveness of vocational agriculture instruction.

In 1970, Binkley (1970, pp. 24-25) stated that "A very important thing affecting learning is the satisfyingness of the learning experience. Satisfyingness promotes learning in two ways: 1) it encourages more experiences of the same kind, and 2) it adds to the intensity of the experience".

The results of a research study by Raymond H. Morton (1979), also pointed out the quality of S.O.E. programs, as measured in terms of student income, project scope, and level of achievement on a multiple-choice test designed to measure technical knowledge in production agriculture for high school students enrolled in production agriculture.

The Importance of the Teacher in Conducting S.O.E. Programs

It is important that the vocational agriculture teacher, as well as other persons who are concerned with the development of these programs, understand the aims and purposes of S.O.E. programs. This should be especially true in vocational agriculture programs where unsatisfactory experience programs have resulted from a lack of teacher, parent, student, or employer understanding, or from inadequate supervision by the instructor. Phipps (1972), stated that ". . .the success or failure

of the Supervised Occupational Experiences programs is largely dependent on the efforts of the teacher of agriculture." He also described the responsibility of the teacher, as follows:

1. Teacher must believe in the program.
2. Teacher must know his subject.
3. Teacher must understand the program. He must understand what is meant by a good S.O.E. program.
4. Teacher must improve his/her professional status by attending inservice education classes, conferences, field trips, reading, workshops, and graduate courses offered during the school year or during the short summer sessions.
5. Teacher must provide guidance for students.
6. Teacher must visit homes and jobs.

It is clear that the student's S.O.E. program will not be better than the teacher of vocational agriculture. The teacher must understand and believe in the value of the S.O.E. program. Clements and Ross (1944), stated that the teacher must understand the students' plans for participation in agriculture. Peterson and McCreight (1973, pp. 245-246), described the responsibility of the teacher as follows:

One of the first requirements of an agricultural educator is to have a real dedication and commitment to a Supervised Occupational Experience program for every student. The "heart" of a vocational agriculture curriculum is the S.O.E. program. It has been stated that education is vocational when it is taught in relation to actual work and observation of specific occupations. From these actual work and observation experiences come the problems, for class discussion. Without S.O.E. programs, vocational agriculture will likely evolve to a "bookish more classroom only experience" with abstract application. The integral relationship of the F.F.A. awards program to the occupational experience program will also be

lost. Consequently occupational experience programs are really the key. A Supervised Occupational Experience program should be required of every student enrolled in a truly vocational agriculture course.

Because of the nature of some S.O.E. programs, a portion of the supervision must be conducted by persons other than the teacher. Such persons are the parents of a student with a supervised farming program on the home farm, or an employer for a student placed in an agribusiness. However, this should not eliminate the need for teacher supervision. Reasons for home and job supervisory visits by the teacher, as stated by Schmidt (1932), include the following:

1. Making sure that the S.O.E. programs are properly planned.
2. Making sure that program plans are carried out.
3. Encouraging the use of knowledge gained at school.
4. Showing a special interest in the student's work.
5. Gaining the support and cooperation of parents or employers.
6. To give additional advice.
7. To teach additional skills.
8. To help solve problems.
9. To evaluate the work and progress of the student.
10. To collect ideas for in-school instruction.
11. To be sure that program records are maintained.
12. To provide an opportunity for the student to do things correctly.

McCracken (1975, pp. 182-183), explained the importance of teacher supervision as follows:

The success or failure of an occupational experience program for a student depends to a large degree upon the effectiveness of the supervision by the teacher.

Effective supervision requires planned programs, instruction, so each student can succeed, and effective evaluation to insure that the plan has been accomplished.

Williams (1977), conducted a study to determine how important vocational agriculture students thought their types of S.O.E. programs (in vocational agriculture) were in developing occupational skills. He compared the opinions of students with placement programs with those who had ownership projects. The students in placement programs believed that they had developed more than those who had ownership projects. These findings may indicate that ownership S.O.E. programs were not as effective in developing some of the identified skills as are other types of S.O.E. programs.

McMillan and Auville (1976), conducted a study to examine factors associated with the success of supervised farming programs in Virginia. It was hypothesized that years of teaching experience (an independent variable) would be positively related to both F.F.A. chapter activity level and the S.O.E. program scope. Among the findings reported was that there was a relationship found between age of the teacher and farming program scores. Farming program scores for students of teachers in the under-thirty age group were lowest. Teachers 31-40 years old had students in production agriculture with the highest farming program scores; the scores declined gradually for older teachers.

In this study they also found significant correlation between the percent of students living in rural areas and 1) the average number of supervisory visits per student, and 2) the students' farming program

scores. Schools reporting more than 76 percent of their students from rural areas had the highest mean farming program score and averaged the highest number of supervisory visits.

Among the conclusions of a study by Williams (1981), in the state of Iowa, was the finding that students perceived their vocational agriculture teachers to be of the greatest assistance in areas related to keeping records, providing encouragement, setting educational goals and learning skills in agriculture.

Research completed in North Carolina by Miller (1980) indicated that S.O.E. programs in North Carolina were classified as "weak" or "very weak" by about one-third of the teachers (34 percent), while one-fourth of the group classified their programs as "strong" or "very strong". In the same study the researcher discovered that most teachers were offering classroom study on S.O.E. programs, but most students were getting an inadequate number of supervisory visits from their teachers, and even those were decreasing.

Types of Supervised Occupational Experience Programs

An important part of vocational agriculture programs are the Supervised Occupational Experience programs of the students. The S.O.E. programs make the instruction in an agricultural course practical and meaningful to the student. They have great motivational value. As Phipps, (1979) stated, the term, "Supervised Occupational Experience" programs, are used to encompass both experience programs for persons who are preparing for farming and experience programs for persons who are preparing for non-farm occupations requiring knowledge

and skill in agriculture. Lamar (1971, pp. 154-165), listed four types of programs that provide experiences related to farming occupations:

1. Supervised farming programs.
2. Farm placement programs.
3. Farming experience on a school farm.
4. Combinations of the above three alternatives.

Pearce, (1965, p. 60) made the following obseration about the Supervised Occupational Experience programs in meeting the needs of all vocational agriculture students:

Society is in a state of continual change, yet many programs are basically no different than they were twenty years ago. Too many have failed to take into account the implications of changes, such as: 1) the decreasing opportunities to begin and advance in the vocation of farming. . . , 2) many of the individuals enrolling in agricultural programs are not from farms while others are not interested in farming as a vocation, 3) changing technology and advancing automation which has altered the make up of the demand of the labor force, and 4) recent legislation providing a broader perspective for the improvement of programs.

In the same article Pearce (1965 p. 60), stated that, "The importance of agricultural training has not decreased by these changes, on the contrary, they indicate that agricultueal training is more necessary than ever before".

Since the Smith-Hughes Act was passed on February 7, 1917, vocational agriculture programs in many secondary schools have been expanded to include preparation for a number of different occupations in agriculture. The expansion has created a need to expand the types of the S.O.E. programs available to students. McCracken (1975, pp. 182-183), described the need as follows:

There can be no adequate training in an agricultural occupation that does not have its foundations in experience participation in the tasks for which the abilities are needed. Individuals in every group taught should have experience programs. What one practices, what he experiences, what he participates in he learns.

Peterson and McCreight, (1973, pp. 245-246) in a journal article, identified five types of S.O.E. programs that could provide opportunities for students who are enrolled in vocational agricultural program, as follows:

1. Supervised farming program.
2. Supervised farm placement program.
3. Supervised laboratory programs.
4. Supervised cooperative agribusiness programs.
5. Supervised exploratory programs.

A brief description of each program is given below.

2.1 Supervised Farming Program

This type of program provides an alternative for ownership, self-employment, and management experience. Historically, supervised farming programs have been planned to include:

- 2.11 Production farm projects,
- 2.12 Improvement practices, and
- 2.13 Occupational or agricultural skills.

The program is designed for students who are becoming prepared to farm. It is also recognized by authors quoted earlier in this study, such as Hammond, (1950); Peterson & McCreight, (1973); and Niagill, (1933) as an excellent agribusiness preparation program.

2.2 Supervised Cooperative Farm Placement

Students without resources for a supervised farming program may elect to develop competencies in production agriculture through employment on a farm. Labor laws and regulations must be considered in this type of program. According to Binkley (1970); Phipps (1972); and Taft (1960), three kinds of this type of S.O.E. program are:

2.21 Farm placement,

2.22 Improvement project (on either the student's home or employer's farm), and

2.23 Agricultural skills.

2.3 Supervised Laboratory Program

This type of S.O.E. program was originally limited to a school's farm. But, as Peterson & McCreight (1973) and Lamar (1971) stated, today these kinds of experiences may involve production projects using the school's farm, greenhouse, or shop. Such experiences would occur outside of the normal classroom setting and shop activities. Other phases of the program would involve improvement projects and the development of agricultural skills. As stated in the Michigan Supervised Agricultural Experience Record Book (1981), the school farm, forest, or special land laboratory should provide several worthwhile learning experiences. In many cases, students will have an opportunity to participate in the production of crops and livestock under proper supervision. Activities should include the operation of farm equipment, the use of new approved practices, the planning and carrying through to completion of improvement projects, and the securing of practical experience in farm accounting and management.

2.4 Supervised Cooperative Agribusiness Programs

A supervised cooperative agribusiness program refers to a program wherein students receive their occupational experience under actual on-the-job situations in cooperation with an employer. The program is cooperative in nature, since the employer recognizes his/her role in making the experience educational. It is his/her responsibility to help provide experiences and on-the-job instruction directly related to the occupation for which the student is being prepared. As Phipps (1972) stated, a good experience program in an off-farm agribusiness is made up of planned jobs and responsibilities in selected cooperating businesses. In this program, students may be on released time from school or may work after school or during the summer months. As Williams (1977) stated, labor laws and regulations restrict this type of program to students who are 16 years of age or older.

2.5 Supervised Exploratory Programs

This type of program may be a beginning experience for some vocational agriculture students. The program, as Peterson & McCreight (1973) stated, has three parts:

- 2.51 Students are required to interview a number of employers and employees in agribusiness firms,
- 2.52 Home improvement projects, and
- 2.53 Occupational skills that may be production or agribusiness in nature.

Planning Supervised Occupational Experiences Programs

Supervised occupational experience programs which provide maximum learning in vocational agriculture in the secondary schools require careful planning. The teacher of vocational agriculture should accept the responsibility for directing planning. The purposes in planning a student's S.O.E. program, as Williams (1977) and Magill (1933) described, can be summarized as follows:

1. To teach students how to anticipate the emergence of conditions and problems, and be prepared to deal with them.
2. To provide a definite plan for teaching students to analyze an occupation.
3. To teach a student to recognize and evaluate improvement practices.
4. To enable the student to determine the possibilities for profit or income from an occupation or business transaction.
5. To be assured that students will carry out jobs and experiences satisfactorily.
6. To provide more meaningful in-school instruction to meet student needs, and to give more information in regard to agricultural occupations.

These purposes represented a composite of the expressed beliefs of a group of teachers of agriculture, state supervisors, and teacher educators. The motivation for their group thinking about S.O.E. programs, as Magill (1933, pp. 57-58) stated, was that ". . .the real purpose of planning is to promote learning."

Binkley (1970), as he stated in his book, believed that ". . . Good planning helps insure at least a moderate amount of success in the first undertaking." In an article, Miller, (1976, pp. 147, 148), indicated that vocational agriculture teachers can justify the supervision of S.O.E. programs as a part of curriculum content because of the modern concept of S.O.E. programs. He also wrote in the same article that:

All students in vocational agriculture need to learn the what, why, and how of supervised occupational experience. There is inadequate time to do this via individual home visits: thus, group instruction becomes a mandate. Not just a few days but perhaps as much as six weeks is needed to establish the concepts and help students identify the opportunities important to them and to prepare plans for becoming involved.

Research completed by Williams (1977), reported that vocational agriculture students in the State of Iowa, identified the help given by their parents and their vocational agriculture teachers among the most important factors in planning and conducting their S.O.E. programs.

Johnson (1954, p. 4), explained the need for planning the S.O.E. programs by using supervised farming programs as an example.

The students must realize that to develop a long time farming program into a practical and sound farming business will require much time, thought, and work. Every individual farming program must have a well developed working plan from the beginning. The students must plan, study, and execute plans. Thinking through to a sound decision requires systematic study. This necessitates that the instructor offer individual, group, and class instruction, based largely on the farming program of the students.

In a study of factors related to the success of New Mexico vocational agriculture as F.F.A. advisors by Vaughn (1976), it was

found that there was a significant relationship between the degree of success of the F.F.A. chapter and the size of the community where the vocational agriculture department was located. This relationship was negative in that as the population size of a community decreased, the degree of F.F.A. chapter success increased.

Nerville (1973) conducted a study to investigate the competencies of tenth grade vocational agriculture students in Ohio and reported a significant positive relationship between the number of S.O.E. programs and achievement scores. In the same study, the researcher also found a positive relationship between achievement test scores and living on a farm.

On the whole, an important step toward quality control in an educational process is the setting of plans for the process. This step provides a framework for selecting activities to meet the standards of that educational process and evaluating the effectiveness of activities in meeting the standards.

Rathurn (1976), in his study, found a significant positive relationship between the extent to which a student participates in a vocational student organization and his/her development of leadership, citizenship, character, willingness to accept responsibility, confidence in self and work and cooperative spirit and effort. He also found, in the same study, that students who were more active were perceived by their teachers, employers or parents as having higher levels of ability in leadership, citizenship, responsibility, confidence, and cooperation, than students who were less active. Employment success of students was found to be significantly related to

the level of participation and length of training.

Evaluation of S.O.E. Programs

The goal of agricultural education and training personnel, administrators, and instructors who are involved in S.O.E. programs, is to offer the highest quality program possible, given the resources available. To achieve this, it is important to evaluate the S.O.E. component in vocational agricultural education programs in order to achieve the following:

1. Find out the strengths and weaknesses of the S.O.E. program.
2. Help the vocational agriculture teacher to evaluate the effectiveness of his/her activities.
3. Determine ways and means of improving the S.O.E. program.

Evaluating a S.O.E. program also assists its teacher in improving his/her program. Recognition also must be given to the fact that a S.O.E. program is evaluated continuously by those who are directly and indirectly affected. It is difficult for students to evaluate their own experience and recognize their progress in learning. To help students recognize their achievements, the teacher can direct the students:

- 1 - To compare achievements with goals set in the planning stage,
- 2 - to consider contributions of occupational experience in agriculture to meeting needs,
- 3 - to identify ways in which the experience in agriculture related to his personal developments, and
- 4 - to find the value in his experience for occupational, and educational planning. (U.S. Office of Education, 1965, p. 66)

Measuring outcomes of an S.O.E. program is the best way of

determining progress toward educational objectives. Also, it is the most difficult part of the whole process of evaluation. The outcomes in which the teacher should be interested are the growth and development of individuals in the achievement of the S.O.E. program objectives. The growth of individuals in S.O.E. programs are often measured indirectly by measuring changes in agriculture. The evaluator who assesses S.O.E. programs in terms of these outcomes should realize that the results may be affected by initiative, subsidies, unusual weather conditions, new varieties, or other variables.

Sledge (1960) stated that in vocational agriculture the teacher can evaluate either 1) outcomes, results, and effects, 2) process, method, procedures, and techniques, or 3) a combination of one and two. This points out that program evaluation should occur during the planning and conducting stages, as well as after an outcome or result has been realized.

Harold Matterson (1972) explained that vocational educators are generally concerned with two types of evaluations: (1) evaluation for improving a program, and (2) evaluation for proving the value and importance of a program. One purpose for the second type is to show the value of a program, or a specific component of a program.

Smith (1957, p. 250), suggested several criteria for use in evaluating the S.O.E. programs:

1. Is it interesting to the student?
2. Does the program emphasize pertinent basic skills?
3. Does the program improve present conditions or introduce new practices?

4. Does the program show financial return to the student?
5. Does the program provide a basis for teaching appropriate competencies?
6. Is the program organized and operated in a business like way?
7. Is the program leading to occupational entry or to additional training?

In an analysis of factors related to the educational plans of vocational agriculture students in the state of Iowa, Byler (1975) found no significant difference in the perceived value of the S.O.E. programs for the occupations which students planned to enter when they were grouped according to their educational plan upon graduation from high school. However, Byler (1976) in another study of factors related to occupation decision-making of senior vocational agriculture students in the state of Iowa, found that students living on farms perceived the value of their Supervised Occupational Experiences, for the occupation they planned to enter, to be significantly greater than the value perceived by off-farm students.

Kash and Barick (1978) presented that:

The element common to all evaluation programs that have successfully increased pupil self-esteem is the provision of feedback under conditions that are non-judgmental, and that focus attention on the pupil, his or her conditions, concerns, and abilities.

Rupert (1956) explained in his article that evaluating supervised occupational experience programs is not an easy task. To know whether or not a program is meeting the needs of the students, and to know

whether or not it is accomplishing its desired purpose, requires careful assessment.

Summary

The success of a vocational agriculture program, in reaching some of its most important aims and objectives, can be achieved using supervised occupational experience programs. It is a learning by doing concept of vocational agriculture, which defines teaching in a nontraditional manner, and includes systematic instruction and supervision outside the classroom. The educational value of S.O.E. programs have been tested in previous years; most of them have been summarized and discussed in this chapter. However, it has also been found that selection and planning of S.O.E. programs could be more effective if specific types of S.O.E. programs and teaching methods were used.

The literature cited in this chapter was presented in the following areas:

The Importance of the S.O.E. Program in Vocational Agriculture, The Purpose of S.O.E. Programs, Major Objectives of S.O.E. Programs, The Values of S.O.E. Programs, The Importance of the Teacher in Conducting S.O.E. Programs, Types of S.O.E. Programs, Supervised Farming Program, Supervised Cooperative Farm Placement, Supervised Laboratory Program, Supervised Cooperative Agribusiness Program, Supervised Exploratory Program, Planning Supervised Occupational Experience Program, Evaluation of S.O.E. Programs.

CHAPTER III

DESIGN AND METHODOLOGY

Introduction

The primary purpose of this study was first to compare the perceived educational competencies of Michigan vocational agriculture students who were enrolled in a production agriculture program with a Supervised Occupational Experience program that focused on one of the following: (a) farm or agribusiness placement programs; (b) school land laboratories; or (c) home farm production, and, the student's place of residence; a) on a farm, or b) in a town, city, or non-farm area. A second purpose was, to analyze relationships between the students' types of S.O.E. program, and the attitudes of the vocational agricultural students.

A mailed questionnaire was used to collect the data from teachers and students concerned. Cover letters accompanied the mailed questionnaires to explain the study and request the cooperation of teachers and students involved in the study (see Appendix B).

The questionnaire was developed in three parts. Part I of the questionnaire was developed to obtain data from vocational agriculture teachers, in regard to:

1. The major focus of the S.O.E. program in which each student in the survey was involved;
(a) Farm or agribusiness placement program,

- (b) School land laboratories, or
- (c) Home farm production,
- 2. The place of residence of each student;
 - (a) Farm, or
 - (b) Non-farm area; and
- 3. The student's general attitudes toward work and fellow workers.

Part II of the questionnaire was designed to obtain data from senior vocational agriculture students, including personal information and a description of the respondent's S.O.E. program. Part III of the questionnaire contained competency statements randomly selected from "Recommended Minimum Vocational/Technical Program Performance Objectives." (Michigan Department of Education Vocation Technical Education Guidelines, 1972).

The procedures used by the researcher in accomplishing the objectives of the study are described in this chapter. These procedures are organized as follows: Population, Sampling Procedures, Development of Instruments, Mailing Procedures, and Methods of Data Analysis.

Population

The target population¹ in this study consisted of all Michigan high school students enrolled in vocational agriculture who were

1. As defined by Borg & Gall (1979) it means all the members of a real or hypothetical set of people, events, or objects to which the researcher wishes to generalize the results of his/her research.

classified as seniors in production agriculture (01.0301) during the 1981-82 school year. A listing of this population in the state of Michigan was obtained from the publication, "Reimbursed Vocational Agri-business and Natural Resources programs in Michigan" (Meaders, 1982), and the "Michigan Agriculture and Natural Resources Education 1981-82; Directory." The target population consisted of all students enrolled in 143 high schools and area vocational centers that were randomly selected from these two sources.

Sampling Procedure

The first step in sampling is to define the target population which has already been mentioned. The sampling procedure involved the selection of a portion of the population, as representative of the target population. To ensure that vocational agriculture teachers and students from the target population in the State of Michigan would be represented in the sample, systematic random sampling procedures were used to obtain a sample from the target population. The systematic random sampling procedure is one in which each individual in the defined target population has an equal chance of being included. As described by Borg and Call (1979), the population used in this study had been listed in a State Directory of Teachers of Vocational Agriculture (1981-82), the directory listed all of the teachers in alphabetical order by school. The list of schools used in this study were randomly chosen from this source.

The main purpose for using a random sampling technique was that systematic random samples yield research data that can be generalized

to a larger population within margins of error that can be determined statistically. Systematic random sampling was also preferred because it permitted the researcher to apply inferential statistics to the data. Inferential statistics enabled the researcher to make certain inferences about the population values (mean, standard deviation, and correlation coefficient) on the basis of sample values obtained.

The size of the samples for this study was 43 schools, or, nearly one-third of the total population. According to Gay (1981), Borg & Gall (1979), and Roseae (1975) the sample size in this study exceeded the minimum number (10-20 percent of total population, or at least 30 subjects) of subject (schools) believed to be acceptable for generalizing research results from sample to target population.

Development of Instrument

The instrument used in the study was designed to obtain descriptive data needed to fulfill the objectives of the study. Part I of the survey instrument was designed to obtain data from vocational agriculture teachers. Data requested included: (1) the major focus of the S.O.E. programs in which each student in the survey was involved, (2) the place of residence of each student, and (3) each student's attitudes toward work and other workers. The development of these questions involved assistance from the researcher's doctoral program committee in reviewing the questions for clarity and appropriateness. Parts II and III of the survey instrument were developed to obtain data from senior vocational agriculture students. Part II included eight questions, designed to obtain personal information and a description of

the major focus of each respondent's S.O.E. program. Part III of the questionnaire contained 52 competency statements which were randomly selected from "Recommended Minimum Vocational Technical program Performance Objectives", (Michigan Department of Education Vocational Technical Guidelines, 1972) (a systematic sampling technique was used).

The researcher developed the research instrument, in the following steps:

- I. Design of research questions to elicit an objective response, for ease in tabulating information from the responses.
- II. Categorization of performance objective questions by type.

The following categories were created.

- A. Forced choice (single choice). This type of question was used when only one choice was desirable. There were seven such questions relative to the following:
 1. The major focus of each student's S.O.E. program,
 2. Each student's place of residence,
 3. The teacher's assessment of each student's attitude toward work and other workers,
 4. The enrollment of the student's father in vocational agriculture during his high school career, the student's F.F.A. membership, and
 5. The student's perceived level of competence.
- B. Rating questions. There was a list of items following each question. The instructors and students were to rate their perceptions of every item listed. There were two types of rating questions. The first type to be completed by teachers,

had a five-choice scale of ratings for the students' attitudes toward work and workers. Their responses could range from very positive to very negative. The second type of rating question provided a four-choice option to be made on a Likert Scale. Students were asked to distinguish whether or not each of the competency statements was a part of their program. They could designate, first, if the competency had not been taught during their educational programs in vocational agriculture by placing a check mark in the appropriate response column. If they determined that a specific competency had been taught, they were to check one of the four choices on the Likert Scale indicating how well that competency had been developed.

III. Organization of the Categories of Questions

Three sets of directions were prepared, one set for each part of the questionnaire to achieve the following:

1. To obtain from the student's teacher a single response in regard to the major focus of the S.O.E. program in which each student was involved, the place of residence of each student, and each student's general attitude toward work and fellow workers.
2. To obtain from each student respondent, a single response in regard to personal information and a description of the major focus of the respondent's

S.O.E. program.

3. To obtain from each student respondent a selection of the appropriate level of perceived competence for each competency statement randomly selected to represent the range of performance objectives a secondary vocational agriculture instructor should be teaching.
4. To obtain a rating of each of the fifty-two competency statements in terms of the students' perceptions, using the following rating scale.
 - 1 - I cannot do this.
 - 2 - I can do this if somebody helps me.
 - 3 - I can do this by myself.
 - 4 - I could show others how to do this.
 - 5 - I have not been taught this.
5. To combine directions to handle a like list of responses.

Instrument validated

The instrument was developed using information from the literature and the researcher's advisory committee of faculty members at Michigan State University. The committee consisted of two representatives with majors in vocational agricultural education, in the Agriculture and Natural Resources Education Institute, one representative with a major in Agricultural Engineering Technology and experience teaching Agricultural Mechanics, in the Department of Agricultural Engineering,

and finally a representative with a major and background experience in curriculum and curriculum development in secondary schools, from the Department of Secondary Education and Curriculum.

The committee members reviewed and made suggestions for improvement in the content and design of the questionnaire. Two members of the committee assisted throughout its development. Upon suggestions from the members of the committee, questions were eliminated, added, or redesigned. Following are the items attended to and the reasons why.

Correspondence Designed and Sent

Four separate letters and questionnaires were developed and mailed to vocational agriculture teachers to be given to their senior vocational agriculture students in collecting the data for this study.

First cover letter

This was an impersonal, fact-oriented letter introducing the project. (See Appendix A.) The researcher made an attempt to organize the information in a way that would be most useful to the recipient. The content information was organized as follows: subjects were told what was in the questionnaire, what the goals of the research were and who might be part of it, how they could help, how and why they were being asked to help, what the attached survey questionnaire form contained, and what considerations should be made before completing the questionnaire form.

The first cover letter with the appropriate survey questionnaire

forms for both vocational agriculture conditions, new varieties, or other variables.

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concept of vocational agriculture, which defines teaching in a nontraditional manner, and includes systematic instruction and supervision outside the classroom. The educational value of S.O.E. programs have been tested in previous years; most of them have been summarized and discussed in this chapter. However, it has also been found that selection and planning of S.O.E. programs could be more effective if specific types of S.O.E. programs and teaching methods were used.

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CHAPTER IV

FINDINGS AND DISCUSSION

Introduction

This chapter presents the analysis of the Michigan vocational agriculture senior students' perceived competence in production agriculture, (01.0301) during 1981-82. The main purpose of this study was to compare student perceived competence in production agriculture and involvement in an S.O.E program that focused on one of the following; a) farm or agribusiness placement program, b) school land laboratories, or c) home farm production. Further, the second purpose was to determine what impact the student's place of residence a) farm, or b) in a town, city, or non farm area had on perceived competence. Finally, the third purpose of the study was to compare students' attitudes toward the world of work and the focus of their S.O.E. program in one of the following; a - farm or agribusiness placement program, b - school land laboratories, or c - home farm production.

In this part of the study, most tables were designed to present the number of responses from students that were used (N), frequencies of the cases (f), and percentages of the cases (%). Variables are prioritized in most table listings. They are prioritized according to the highest frequency of the cases from highest to lowest. Prior to the discussion of the major hypotheses, other relationships are examined to explore possibilities for further research. No research

hypotheses were stated for these relationships which were examined using Chi square analysis to find possible relationships between variables. Some of the tables were summarized more completely in additional tables in Appendix C and D. This was done to aid the reader who wants quickly to identify and compare the items most responded to by the instructors and students.

Response Rate

Of the 43 vocational agricultural schools that had a production agriculture program (01.0301) and were randomly selected and sent a set of survey questionnaires, 41 completed and returned a survey. The response rate was 95.3 percent. Forty sets (97.5 percent of the 41 sets returned) were used. Therefore, 93.0 percent of the sets of the survey questionnaires mailed were used. The reasons that one of the total returned sets of the survey questionnaires were not used were,

- a) - Part I of the questionnaire was not completed by instructor,
- b) - Part III of the questionnaire was not completed by the students,
- c) - After sending another set of the survey of questionnaire including a personal cover letter to the instructor, the completed set of the survey questionnaire was never returned.

Table 2 indicates the number of survey questionnaires that were used (N), the number of sets of questionnaires (N.S.), percentages per kind of collecting data, frequencies of schools (F.S), and frequencies of students' questionnaire (F). Included were: a) first survey questionnaire and cover letter, b) follow-up reminder letter, c) first follow-up reminder telephone call, and finally d) second

follow-up reminder telephone call. There was a total of 331 survey questionnaires used. In the period of time between the first and second mailings, 192 survey questionnaires were returned. In the period between the second and third follow-up mailings and telephone calls, 55 survey questionnaires were returned. In the space of time between the third contact with the instructor, and the first follow-up reminder telephone call (and fourth contact), the second follow-up reminder telephone call, 52 usable survey questionnaires were returned.

In the space of time the fourth contact with vocational agriculture instructor and the information was entered into the computer, 32 usable survey questionnaires were returned.

Table 2
Kinds of Mailings Prompting Return
of Usable Data
(N.S. = 40, N = 331)

Kinds of Mailing	Survey Returned that were usable	
	F.S. %	F %
First survey questionnaire	<u>23</u> 53.4	<u>192</u> 58.0
Reminder letter	<u>6</u> 13.9	<u>55</u> 16.6
First reminder telephone Call	<u>7</u> 16.2	<u>52</u> 15.7
Second reminder telephone call	<u>4</u> 9.3	<u>32</u> 9.6
Total	<u>40</u> 100.0	<u>331</u> 100.0

Characteristics of Vocational Agriculture Students

One of the purposes of this study was to provide statewide information about some descriptive characteristics of the vocational agriculture students who were involved in S.O.E. programs in the state of Michigan, and to provide information in regard to their perception of their professional development.

This part described the personal characteristics of the vocational agriculture students who were chosen to participate in the research sample and tested for significant relationships of selected variables and the students' focus of S.O.E. program in vocational agriculture program, and the students' place of residence.

Kinds of S.O.E. Programs on Which the Students Focused

Table 3 shows the number of survey questionnaires that were used (N) frequency (F) and percentages (%) of each type of S.O.E. programs which served as the focus of the students' experiences in vocational agriculture during their enrollment in an agricultural production program.

Table 3
Kinds of S.O.E. Programs in Which Students
Participated
(N = 331)

Kinds of S.O.E. programs	Frequency of Response	
	F	%
Home Farm Production	129	38.9
School Land Laboratories	109	32.9
Farm or Agribusiness Placement program	93	28.1
Total	331	100.0

In analyzing the data pertaining to the type of S.O.E. program the student focused on, a total of 331 survey questionnaires were used. One hundred twenty-nine (38.9 percent) of the students utilized Home Farm Production programs to obtain their supervised occupation experience, one hundred nine (32.9 percent) of the respondents reported participation in School Land Laboratory programs as their major source of supervised experience, and 93 of the students (28.1 percent) used Farm or Agribusiness Placement program to obtain most of their occupational experience when enrolled in vocational agriculture. It is interesting to note that over 60 percent of the respondents gained most of their supervised occupational experience through other than a home farm production program.

Students' Fathers' Enrollment Based on the Kind of S.O.E. Program.

The fathers of respondents who enrolled in vocational agriculture are reported in Table 4, by the type of S.O.E. programs in which the students participated. Of the students whose S.O.E. program focused on School Land Laboratories, almost three fourths (74.5 percent) of the students' fathers were not enrolled in vocational agriculture program during their high school years. Of those who participated in an S.O.E. program that focused on a Farm or Agribusiness Placement program, about one-third (34.8 percent) of their fathers were enrolled in a vocational agriculture program. But in the Home Farm Production program slightly less than half of the respondents fathers (43.8 percent) were enrolled. On the whole, almost two thirds of the students fathers (64.9 percent)

were not enrolled in a vocational agriculture program during high school. The Chi-square value of 8.3 was significant at the .05 level of significance indicating that a significant relationship existed between the students' fathers' enrollment and the students type of S.O.E. program on which they focused.

Table 4
Frequency and Percentage of Students Fathers Enrollment Based
on the Kinds of S.O.E. Program Which Students Focused

Kinds of S.O.E. program For Students	Students' Father Enrollment					
	Enrolled		Not Enrolled		Total	
	N	%	N	%	N	%
Home Farm Production	53	43.8	68	56.2	121	100.0
School and Land Laboratories	27	25.5	79	74.5	106	100.0
Farm or Agribusiness Placement program	32	34.8	60	65.2	92	100.0
Total	112	35.1	207	64.9	319	100.0

Chi Square = 8.34

df = 2

Missing Observations = 12

F.F.A. Membership Based on Type of S.O.E. Program

Table 5 presents the frequency and percentage of responses to the question, "Are you an F.F.A. member?" Over 80 percent of the respondents whose S.O.E. program focused on either Home Farm Production (84.9 percent) or Farm or Agribusiness Placement program (86.0 percent) were F.F.A. members. Slightly more than one-half (58.3 percent) of the vocational agriculture students who utilized School Land Laboratories

extensively reported that they were members of the F.F.A.

Table 5
Frequency and Percentage of Students' Enrollment in F.F.A.
Based on the Kind of S.O.E. Program Which
Students Focused.

Kinds of S.O.E. Programs For Students	Frequency of Responses					
	F.F.A. Member		Not F.F.A. Member		Total	
	N	%	N	%	N	%
Home Farm Production	107	84.9	19	15.2	126	100.0
School Land Laboratories	63	58.3	45	41.7	108	100.0
Farm or Agribusiness Placement program	80	86.0	13	14.0	93	100.0
Total	250	76.5	77	23.5	327	100.0

Chi square = 29.44

df = 2

Missing observations = 4

The Chi-square was used to test for significant relationships between the students' type of S.O.E. program and their F.F.A. membership. The Chi-square value of 29.44 was significant at the .05 level. Therefore, there was a significant relationship that existed between the students' type of S.O.E. program and their F.F.A. membership.

Students' F.F.A. Degree Earned and Type of S.O.E. Program

There was not a significant relationship between students' type of S.O.E. program and the F.F.A. degree earned as indicated by the Chi-square value of 48.55, as reported in Table 6. Of the respondents who earned an F.F.A. degree, a large majority of students, in a Farm or

Agribusiness Placement program (82.8 percent), or in Home Farm Production (84.9 percent) had earned an F.F.A. degree. Less than one-half (47.2 percent) of the respondents in a Land Laboratory Program earned an F.F.A. degree. Over one-fourth of total number of respondents to the survey (28.1 percent) had not earned an F.F.A. degree.

Table 6
Frequency and Percentage of Students' F.F.A. Degree Ownership
Land on the Kind of S.O.E. Program Which
Students Focused
(N = 331)

Kind of S.O.E. Programs For Students	Frequency of Response					
	F.F.A. Degree		No F.F.A. Degree		Total	
	N	%	N	%	N	%
Home Farm Production	107	84.6	19	15.1	129	100.0
School Land Laboratories	51	47.2	57	52.8	108	100.0
Farm or Agribusiness Placement	77	82.8	16	17.2	93	100.0
Total	235	71.9	92	28.1	327	100.0

Chi-square = 48.55

df = 2

Missing Observations = 4

Table 6 indicates a Chi-square of 48.55 was found. The probability of obtaining a value this large with 2 degrees of freedom is less than .0000; is ". . .less than one chance in 10,000" (NIE, 1975 p. 224), so the researcher concluded that this Chi-square is very large indeed. Since the cell frequencies deviate so much from what we would expect under the conditions of statistical independence, the researcher

concluded that a systematic relationship did exist between the kind of S.O.E. program and the F.F.A. degree earned by students.

Type of F.F.A. Degree Earned Based on the Kind of S.O.E. program

The type of F.F.A. degree earned by the respondents are reported in Table 7. Of those whose S.O.E. program focused on Home Farm Production almost one-half (47.3 percent) reported that the Chapter Farmer degree was the highest F.F.A. degree earned; one-fourth (24.3 percent) were holding a State Farmer degree; and a small portion (14.7 percent) had not earned a F.F.A. degree.

Table 7
Frequency and Percentage of Students' Type of F.F.A Degree
Based on the Kind of S.O.E. Program Which
Students Focused
(N = 331)

Kind of S.O.E. Program For Students	Type of F.F.A. Degree				Total N%
	G.H.D.* N%	C.F.D.** N%	S.F.D.*** N%	No Degree N%	
Home Farm Production	$\frac{14}{10.9}$	$\frac{61}{47.3}$	$\frac{31}{24.8}$	$\frac{19}{14.7}$	$\frac{129}{100.0}$
School Land Laboratories	$\frac{7}{6.4}$	$\frac{36}{33.0}$	$\frac{8}{7.3}$	$\frac{57}{51.4}$	$\frac{108}{100.0}$
Farm or Agribusiness Placement	$\frac{9}{9.7}$	$\frac{52}{55.9}$	$\frac{16}{17.2}$	$\frac{16}{17.2}$	$\frac{93}{100.0}$
Total	$\frac{30}{9.2}$	$\frac{149}{45.7}$	$\frac{55}{16.9}$	$\frac{92}{28.2}$	$\frac{326}{100.0}$

Chi-square = 4.80

d f = 4

Missing Observation = 4

*G.H.D. = Green hand Degree

*C.F.D. = Chapter Farmer Degree

*S.F.D. = State Farmer Degree

Of the respondents with a focus on experience in Land Laboratories, less than one-half had earned a F.F.A. degree, and less than one-third (33.0 percent) of the respondents had a Chapter Farmer degree as the highest degree earned.

Slightly more than one-half (55.9 percent) of the respondents who focused on Farm or Agribusiness Placement programs were holding a Chapter Farmers degree. In this group, a small portion (17.2 percent) of the students had not earned any F.F.A. degree. The chi-square value of 4.80 was not significant at the .05 level. Therefore, it may be concluded that no relationship existed between kind of S.O.E. program and type of F.F.A. degree earned by vocational agriculture students.

Number of Semesters Students Enrolled in Vocational
Agriculture by Type of S.O.E. Program

Table 8 shows the frequency and percentage of responses to the question "How many semesters of high school vocational agriculture have you completed?" Slightly more than one-half of the students (53.7 percent) who focused on Home Farm Production S.O.E. programs were enrolled 8 semesters or more in vocational agriculture.

Of the 121 students in Home Farm Production, seven students (5.7 percent) were enrolled between 1-3 semesters, and 40.5 percent of the respondents in this group were enrolled between 4-7 semesters. In the school Land Laboratories group, almost one-half of the students (45.1 percent) were not enrolled more than three semesters; 26.9 percent of

Table 8
Frequency and Percentage of Number of Semester Students
Enrolled in Vocational Agriculture by
Type of S.O.E. Program
(N = 331)

Type of S.O.E. Program For Students	Number of Semesters							
	1-3		4-7		8 . .		Total	
	N	%	N	%	N	%	N	%
Home Farm Production	7	5.7	49	40.5	65	53.7	121	100.0
School Land Laboratories	47	45.1	28	26.9	29	27.8	106	100.0
Farm or Agribusiness Placement	7	8.0	45	51.7	35	40.2	87	100.0
Total	61	19.5	122	39.1	129	41.3	312	100.0

Chi-square = 69.99

d f = 6

Missing observation = 19 (5.71)

the students were enrolled between 4-7 semesters, and the rest of the students in this group (27.8 percent) were enrolled eight or more semesters. More than one-half (51.7 percent) of students in Farm or Agribusiness Placement programs were enrolled between 4-7 semesters in vocational agriculture programs; 40.2 percent were enrolled eight or more than eight semesters in the program and a small porportion of these students (8.0 percent) were enrolled less than three semesters. A large majority of the students (80.4 percent) in all three groups were enrolled four or more than four semesters in the vocational agriculture program during high school.

In Table 7, a very large Chi-square of 69.99 was reported. The probability of obtaining a value this large with 6 degrees of freedom is less than .0000, ". . .less than 1 chance in 10,000" (NIE, 1975, p.

224). It is, indeed, statistically significant at the .0001 level. We can conclude that a systematic relationship did exist between the type of S.O.E. program and the number of semesters students enrolled in vocational agriculture.

Students Attitudes Toward Work and Workers
Based on Type of S.O.E. Program.

Table 9 represents the frequency and percentage of three groups of students and their level of positive attitudes toward work and workers. Slightly less than three-fourths (73.6 percent) of the students who focused on Home Farm Production held positive or very positive attitudes. Only a very small portion of students (3.1 percent) had negative attitudes and none of the students had very negative attitudes toward work and workers. Of the 108 students in School Land Laboratory programs only two students (1.9 percent) had very negative attitudes, and more than sixty percent of students in this group had positive or very positive attitudes toward work and workers. In the third group, (Farm or Agribusiness Placement programs), slightly more than seventy percent of the students had very positive or positive attitudes and only 9.7 percent reportedly had negative attitudes toward work and workers.

Only two out of all of the respondents (330) in the study reported that they had very negative attitudes; 20 students (4.1 percent) had

Table 9
Frequency and Percentage of Different Level of Students'
Attitude Based on the Kind of S.O.E. Program
Which Students Focused
(N = 331)

Kind of S.O.E. Program For Students	Students' Attitudes					Total N%
	Very Posit N %	Posit N %	Medium N %	Negat N %	Very Neg. N %	
Home Farm Production	55 42.6	40 31.0	30 23.3	4 3.1	0 0	129 100
School Land Laboratories	18 16.7	47 43.5	34 31.5	7 6.5	2 1.9	108 100
Farm or Agribusiness Placement Program	31 33.3	35 37.6	18 19.4	9 9.7	0 0	93 100
Total	104 31.5	122 37.0	82 24.8	20 5.1	2 .6	330 100

Chi-square = 26.40

d f = 8

Missing observations = 1

negative attitudes; and more than one-third of the students in the survey had positive or very positive attitudes toward work and workers. The Chi-square value of 26.40 was not significant at the .05 level of significance. Therefore, it was concluded that no relationship existed between students' type of S.O.E. programs and their level of attitudes toward work and workers.

The Place of Residence

Table 10 presents the frequency and percentage of respondents by their place of residence and the focus of their S.O.E. programs. According to the collected data, slightly more than one-half of all of the respondents (55.9 percent) lived on a farm. Nearly all of these

students (92.2 percent) with a Home Farm Production S.O.E. program lived on a farm; and less than one-tenth resided in a Non-farm area. Of the students with a School Land Laboratory, S.O.E. program, (78.0 percent) lived in a Non-Farm area. Almost one-half of the students (45.2 percent) whose S.O.E. program focused on Farm or Agribusiness Placement lived on a farm, and 54.8 percent were from a non farm area.

Table 10
Frequency and Percentage of The Kind of S.O.E. Program Which
Students Have Focused On, Based on the
Students Home Location
(N = 331)

Place of Residence For Students	Frequency of Response							
	Home Prod.		Land Lab.		Farm or Agbusiness		Total	
	N	%	N	%	N	%	N	%
Farm	119	92.2	24	22.0	42	42.5	185	55.9
Not on Farm	10	7.8	85	78.0	51	56.8	144	44.1
Total	129	100.0	109	100.0	93	100.0	331	100.0

Students Whose Fathers had Enrolled in Vocational
Agriculture Schools Based on the Place of Residence

Table 11 presents the frequency and percentage of responses to the question, "Did your father enroll in vocational agriculture during high school?"

Slightly more than one-half (57.0 percent) of the students who lived on a farm responded that their fathers did not enroll in vocational agriculture during high school. Only one-fourth of the students who came from non-farm areas indicated that their fathers were enrolled in vocational agriculture program during high school. The

Chi-square value was not significant at the .05 level. Therefore, we can conclude that no relationship existed between students' place of residence and their fathers' enrollment in vocational agriculture during high school.

Table 11
Frequency and Percentage of Students Whose Fathers
Had Enrolled in Vocational Agriculture, Based
On the Students' Place of Residence
(N = 331)

Place of Residence For Students	Students' Fathers' Enrollment					
	Enrolled		Not Enrolled		Total	
	N	%	N	%	N	%
Farm	77	43.0	102	57.0	179	100.0
Not on Farm	35	25.0	105	75.0	140	100.0
Total	112	35.1	207	64.9	319	100.0

Chi-square = 10.41

d f = 1

Missing observations = 12

Enrollment of Students who were F.F.A. Members Based
on the Place of Residence

A significant relationship existed between students' place of residence and their F.F.A. membership as indicated by the Chi-square value of .004 reported in Table 12. More than eighty-two percent of the respondents who lived on a farm were F.F.A. members.

Sixty-nine percent of the students who did not live on a farm, were F.F.A. members. A majority of the total respondents (76.5 percent) were F.F.A. members.

Table 12
Frequency and Percentage of Students' Enrollment in F.F.A.
Based on the Students' Place of Residence
(N = 331)

Place of Residence For Students	Students' F.F.A. Membership					
	F.F.A. Membership		Not F.F.A. Member		Total	
	N	%	N	%	N	%
Farm	150	82.4	32	17.6	182	100.0
Not on Farm	100	69.0	45	31.0	145	100.0
Total	250	76.5	77	23.5	327	100.0

Chi-square = .004

d f = 1

Missing observations = 4

Students' F.F.A. Degree Earned Based on the
Place of Residence

The number of students who earned a F.F.A. degree are reported in Table 13. Over 80 percent of the respondents (81.9 percent) who lived on a farm had earned at least one F.F.A. degree.

Table 13
Frequency and Percentage of Students' F.F.A. Degree Ownership
Based on the Students' Place of Residence N=331

Place of Residence For Students	Frequency of Response					
	F.F.A. Degree		No F.F.A. Degree		Total	
	N	%	N	%	N	%
Farm	149	81.9	33	18.1	182	100.0
Not on a Farm	86	59.3	59	40.7	145	100.0
Total	235	55.7	92	44.3	327	100.0

Chi-square =20.31

d f = 1

Missing observations = 4

Slightly more than one-half (55.7 percent) of the students from non-farm areas received one or more F.F.A. degrees during high school. The Chi-square was used to test for a significant relationship between the place of residence and the F.F.A. degree earned. The Chi-square value of 20.31 was significant at the .05 level. Therefore, we can conclude that a significant relationship existed between students' place of residence and the F.F.A. degree earned.

Type of Students' F.F.A. Degree Earned Based
on Place of Residence

Table 14 presents the frequency and percentage of responses to the type of F.F.A. degree earned during high school. Of the 331 surveys used four students did not respond to this question. Thirty-three of the respondents (18.13 percent) who lived on a farm reported they had

Table 14
Frequency and Percentage of Students' Type of F.F.A. Degree
Based on the Students' Place of Residence
(N = 331)

Place of Residence For Students	Type of F.F.A. Program				Total
	C.H.D. *	C.F.D. **	S.F.D. ***	No D.	
	N/%	N/%	N/%	N/%	N/%
Farm	18 9.89	83 45.60	48 26.37	33 18.13	182 100.0
Not on a Farm	12 8.28	66 45.52	8 5.52	59 40.69	145 100.0
Total	30 9.17	149 45.57	56 17.13	92 28.13	327 100.0

Chi-square = 15.96

d f = 2

Missing observations = 4

*G.H.D. = Green Hand Degree

**G.F.D. = Chapter Farmer Degree

***S.F.D. = State Farmer Degree

not earned an F.F.A. degree. However, fifty-nine students (40.1 percent) who lived in a Non-farm area had not earned an F.F.A. degree. A number of students in both groups (45 percent) had a Chapter Farmer degree. The percentage in both groups who had earned only a Green Hand degree was very close (for those students from a farm, 9.8 percent; and for those from a non-farm area was 8.2 percent). But, almost five times the number of students who lived on a farm earned a State Farmer degree than those students from a non-farm area. The Chi-square value of 15.9 was significant at the .05 level, indicating that a significant relationship existed between students' place of residence and the type of F.F.A. degree earned.

Number of Semesters Students were Enrolled in Vocational
Agriculture Programs and Place of Residence

Table 15 shows the frequency and percentage of responses to the question "How many semesters of high school vocational agriculture have you completed?" Slightly more than one-half of the students who lived on a farm (52.6 percent) were enrolled in a vocational agriculture program eight semesters or more. Also, 35.9 percent of the students from the same group were enrolled between four and seven semesters, and the remainder (10.6 percent) in this group were enrolled in vocational agriculture programs three semesters or less. Almost one-third of the students (30.9 percent) who did not live on a farm were enrolled in a vocational agriculture program three semester or less, (41.7 percent) of them were enrolled between 4-7 semesters, and only slightly more than one-fourth (27.3 percent) were enrolled eight semesters or more.

Table 15
Frequency and Percentage of Number of Semesters of Students
Enrollment in Vocational Agriculture Based on the
Students' Place of Residence
(N = 331)

Place of Residence	Number of Semesters							
	1-3		4-7		8-		Total	
	N	%	N	%	N	%	N	%
Farm	18	10.6	64	36.9	91	52.6	173	100.0
Not on a Farm	43	30.4	58	41.7	38	27.3	139	100.0
Total	61	19.5	122	39.1	129	41.3	312	100.0

Chi-square = 29.44

d f = 3

Missing Observation = 19 (5.7 percent)

In Table 15, a Chi-square of 29.66 was found. The probability of obtaining a value this large with 3 degree of freedom is less than .0000 ". . .less than one chance in 10,000," (NIE, 1975 p.224) so we conclude that this Chi-square is very large indeed. In this case, the chi-square is statistically significant at the .0001 level. The researcher concluded that a systematic relationship did exist between the students' place of residence and the number of semesters the students were enrolled in vocational agriculture.

Students Attitudes Toward Work and Workers Based on Place of Residence

Table 16 shows the frequency and percentage of responses by level of positive attitudes toward work and workers. The percentage of students who lived on a farm and had a very positive attitude is more

than two times the percentage of students who are from non-farm areas and who had very positive attitudes. The percentage of students who had positive attitudes in both groups (Farm area, 37.3 percent and non-farm area, 36.6 percent) were almost the same. The percentage of students who lived on a non-farm area and had a negative level of attitude (10.3 percent) was slightly less than five times the percentage of students who lived on a farm (2.7 percent) with negative attitudes.

Table 16
Frequency and Percentage of Different Levels of Students' Attitudes
Based on the Students' Place of Residence
(N = 331)

Place of Residence For Students	Students Attitudes					Total N/ %
	Very Positive N/ %	Positive N/ %	Medium N/ %	Negative N/ %	Very Negative N/ %	
Farm	<u>77</u> 41.6	<u>69</u> 37.3	<u>34</u> 18.4	<u>5</u> 2.7	<u>0</u> 0	<u>185</u> 100
Not on a Farm	<u>27</u> 18.6	<u>53</u> 36.6	<u>48</u> 33.1	<u>15</u> 10.3	<u>2</u> 1.4	<u>145</u> 100
Total	<u>106</u> 31.5	<u>122</u> 37.0	<u>82</u> 24.8	<u>2</u> 6.1	<u>2</u> .6	<u>370</u> 100

Chi-square = 31.13

d f = 4

Missing Observations = 1

The Chi-square value of 31.13 was significant at the .05 level of significant, indicating that a significant relationship, existed between students' place of residence and their level of positive attitudes toward work and workers.

Analysis of Variance of the Level of Students' Perceived
Competence in Productive Agriculture by Kind of S.O.E.
Program on Which The Students Focused

Table 17 presents the mean, standard deviations, F-ratios, and the significance of F for three types of S.O.E. programs:

- a) Farm or agribusiness placement program;
- b) School land laboratories, or
- c) Home farm production.

When the respondents were grouped according to those who focused on these programs, as indicated in Table 17, the F-ratio is significant, so the researcher concluded that there was enough evidence to be at least 95% confident that a given student's perceived competence in production agriculture depends on the type of S.O.E. program on which the student focused. For competencies with a significant F-ratio, t-tests were carried out to compare means.

Table 17
Mean, Standard Deviation, and t-test Analysis of Variance for the
Level of Students' Perceived Competence in Production
Agriculture by the Kind of S.O.E. Program on Which
Students Focused
(N = 331)

Kind of S.O.E. Program For Students	Mean	S.D.	F-ratio	Sign. F
Home Farm Production	2.40	.545		
School Land Laboratories	2.32	.502	6.867	.001
Farm or Agribusiness Placement Program	2.59	.482		

$\alpha = .05$

Hypothesis 1

H_1 : Michigan 1981-82 senior secondary vocational agriculture students in production agriculture whose S.O.E. programs focused on Home Farm Production will have a higher level of perceived competence in production agriculture than those whose S.O.E. programs have focused on School Land Laboratories.

H_0 : Michigan 1981-82 senior secondary vocational agriculture students in production agriculture whose S.O.E. programs focused on Home Farm Production will not have a higher level of perceived competence in production agriculture than those whose S.O.E. program have focused on School Land Laboratories.

$$H_1: \mu_1 \geq \mu_2$$

$$H_0: \mu_1 < \mu_2$$

$$\alpha = .05$$

Results of the t-test for the first hypothesis are summarized in Table 18. As indicated in Table 18, there was not enough evidence to be 95% confident that a given student's perceived competence in production agriculture depends on the focus of his/her S.O.E. program (School Land Laboratories or Home Farm Production). So the researcher can conclude that there was enough evidence to be 95% confident to reject H_0 , that indicated group one (students who focused on School Land Laboratory programs) will have a higher level of perceived competence in production agriculture than group two (the students who focused on the Home Farm Production program).

Table 18
Mean, Standard Deviation, and t-test Analysis of Differences for the
Level of Students' Perceived Competence in Production Agriculture
by the Kind of S.O.E. Program Which Students Focused.
(N = 331)

Kind of S.O.E. Program	Mean	S.D.	t-value	P-value
School Land Laboratories	2.32	.50	1.16	.24
Home Farm Production	2.40	.54		

$\alpha = .05$

Hypothesis 2

H_1 : Michigan 1981-82 senior secondary vocational agriculture students in production agriculture whose S.O.E. programs focused on School Land Laboratories will have a higher level of perceived competence in production agriculture than those whose S.O.E. programs have focused on Farm or Agribusiness Placement programs.

H_0 : Michigan 1981-82 senior secondary vocational agriculture students in production agriculture whose S.O.E. programs focused on School Land Laboratories will not have a higher level of perceived competence in production agriculture than those whose S.O.E. program have focused on Farm or Agribusiness Placement programs.

$$H_1: \mu_1 \geq \mu_2$$

$$H_0: \mu_1 < \mu_2$$

$\alpha = .05$

Comparisons between those students who focused on the School Land Laboratories for their S.O.E. program and students who focused on Farm or Agribusiness Placement programs in the area of perceived

competenceies and testing above hypothesis are summarized in Table 19. As Table 19 shows, the P-value is significant, so the researcher can conclude that there was enough evidence to be at least 95% confident that a given student's perceived competence in production agriculture depends on the focus of his/her S.O.E. program (School Land Laboratories or a Farm or Agribusiness Placement program).

Table 19
Mean, Standard Deviation, and t-test Analysis of Differences for the
Level of Students' Perceived Competence in Production Agriculture
by the Kind of S.O.E. Program Which Students Focused
(N = 331)

Kind of S.O.E. Program	Mean	S.D.	t-value	P-value
School Land Laboratories	2.32	.50	-3.79	.00
Farm or Agribusiness Placement Program	2.58	.48		

$\alpha = .05$

The mean score of perceived competencies on production agriculture programs for students who focused on Farm or Agribusiness Placement programs was significantly higher than students who focused on School Land Laboratories. Therefore, the hypothesis H_1 is rejected and the directional hypothesis of H_0 which indicated that those students who focused on Farm or Agribusiness Placement programs will have a higher level of perceived competence in production agriculture than those students who focused on School Land Laboratories can be accepted.

Hypothesis 3

H_1 : Michigan 1981-82 senior secondary vocational agriculture students in production agriculture whose S.O.E. programs focused on Home Farm Production will have a higher level of perceived competence in production agriculture than those whose S.O.E. programs have focused on Farm or Agribusiness Placement program.

H_0 : Michigan 1981-82 senior secondary vocational agriculture students in production agriculture whose S.O.E. programs focused on Home Farm Production will not have a higher level of perceived competence in production agriculture than those whose S.O.E. program have focused on Farm or Agribusiness Placement Program.

$$H_1: \mu_1 \geq \mu_2$$

$$H_0: \mu_1 < \mu_2$$

$$\alpha = .05$$

Table 20 presents means, standard deviaitions, t-value and the P value for the two groups of students who focused on Home Farm Production programs and Farm or Agribusiness Placement in the area of the perceived competencies in production agriculture. As Table 20 shows, the P-value is significant, so the researcher can conclude that there was enough evidence to be at least 95% confident that a given student's perceived competence in production agriculture depends on the focus of his/her S.O.E. program (a Home Farm Production or a Farm or Agribusiness Placement program).

Table 20
Mean, Standard Deviation, and t-test Analysis of Differences for the
Level of Students' Perceived Competence in Production Agriculture by
the Kind of S.O.E. Program on Which the Students Have Focused
(N = 331)

Kind of S.O.E. Program	Mean	S.D.	t-value	P-value
Home Farm Production	2.40	.56	-2.60	.01
Farm or Agribusiness Placement Program	2.58	.68		

$\alpha = .05$

Based on the Mean scores, the group of students who focused on Farm or Agribusiness Placement programs had a higher value of Mean than those who focused on Home Farm Production programs. Therefore, the hypothesis H_1 is rejected and the directional hypothesis H_0 which indicated that those students who focused on Farm or Agribusiness Placement program will have a higher level of perceived competence in production agriculture than those students who focused on Home Farm Production programs.

Analysis of Variance for the Level of Students' Perceived
Competence in Production Agriculture by the Place of Residence

Hypothesis 4

H_1 : Michigan 1981-82 senior secondary vocational agriculture students in production agriculture whose place of residence is in a town, city or non-farm area will have a higher level of perceived competence in production agriculture than those whose place of residence is on a rural farm.

H_0 : Michigan 1981-82 senior secondary vocational agriculture

students in production agriculture whose place of residence is in a town, city or non-farm area will not have a higher level of perceived competence in production agriculture than those whose place of residence is on a rural farm.

$$H_1: \mu_1 \geq \mu_2$$

$$H_0: \mu_1 < \mu_2$$

$$\alpha = .05$$

Table 21 shows, the mean, standard deviations, t-value, and P-value for the students' perceived competencies in production agriculture for students grouped according to their home residence. The P-value is significant, so the researcher can conclude that there was enough evidence to be at least 95% confident that a given student's competence in production agriculture depends on his/her Place of Residence.

Table 21
Mean, Standard Deviation, and t-test Analysis of Differences for the
Level of Students' Perceived Competence in Production Agriculture
by the Students' Place of Residence.
(N = 331)

Place of Residence	Mean	S.D.	t-ratio	P-ratio
Farm	2.49	.52	2.54	.012
Non Farm Area	2.34	.50		

$$\alpha = .05$$

The mean score of the level of perceived competence in production agriculture of students who lived on a rural farm was significantly higher than that of students who did not live on a rural farm, or lived in a town, city or non-farm area. Therefore the hypothesis H_1 was

rejected and the Hypothesis H_0 was accepted, which indicated that those students who lived on a rural farm will have a higher level of perceived competence in production agriculture than those who lived in a town, city or non-farm area.

Analysis of Variance for the Level of Students' Positive Attitude Toward Work and Workers by the Kind of S.O.E. Programs on Which Students Focused

The mean, standard deviation, F-ratio, and the significance of F for the level of positive attitudes toward work and workers of the students who were grouped in three groups according to the focus of their S.O.E. program has been reported in Table 22. The F-ratio is significant, so the researcher can conclude that there was enough evidence to be at least 95% confident that a given level of a student's attitudes toward work and workers depends on the type of S.O.E. programs on which he/she focused. For competencies with a significant F-ratio, t-tests were carried out to compare means.

Table 22
Mean, Standard Deviation, and Analysis of Variance for the Level of Students' Attitudes Toward Work and Workers by the Kind of S.O.E. Program Which Students Focused N = 331

Kind of S.O.E. Program	Mean	S.D.	F-ratio	Sign F
Home Farm Production	1.87	.87		
School Land Laboratories	2.33	.89	7.76	.001
Farm or Agribusiness Placement Program	2.05	.96		

$\alpha = .05$

Hypothesis 5

H_1 : The 1981 - 82 Michigan senior secondary vocational agriculture students in production agriculture whose S.O.E. programs focused on Home Farm Production Program will have a higher level of positive attitude toward work and workers than those whose S.O.E. programs focused on School Land Laboratories.

H_0 : Michigan 1981-82 senior secondary vocational agriculture students in production agriculture whose S.O.E. programs focused on Home Farm Production Program will not have a higher level of positive attitudes toward work and workers than those whose S.O.E. programs have focused on School Land Laboratories.

$$H_1: \mu_1 \geq \mu_2$$

$$H_0: \mu_1 < \mu_2$$

$$\alpha = .05$$

Results of the t-test for Hypothesis number five are summarized in Table 23. As indicated in this table, the p-value is significant, so the researcher can conclude that there was enough evidence to be at least 95% confident that there was statistically significant differences on the level of positive attitudes toward work and workers, between the students who focused on School Land Laboratories and students who focused on Home Farm Production.

The mean scores, of 2.33 for the students who focused on the School Land Laboratories was significantly higher (at the .05 level of significance) than the mean score of 1.87 for the students who focused on the Home Farm Production programs, for the factor students' positive

attitudes toward work and workers. Thus, it can be concluded that students who did focus on Home Farm Production programs did not have a higher level of positive attitudes toward work and workers than those who focused on School Land Laboratory programs. Therefore, the hypothesis H_1 is rejected and the directional hypothesis H_0 can be accepted.

Table 23
Mean, Standard Deviation, and t-test Analysis of Differences for the
Level of Students' Positive Attitudes Toward Work and Workers by
the Kind of S.O.E. Program Which Students Focused
(N=331)

Kind of S.O.E. Program	Mean	S.D.	t-ratio	P-ratio
School Land Laboratories	2.33	.89	4.02	.00
Home Farm Production	1.87	.87		

$\alpha = .05$

Hypothesis 6

H_1 : Michigan 1981-82 senior secondary vocational agriculture students in production agriculture whose S.O.E. programs focused on Farm or Agribusiness Placement will have a higher level of positive attitudes toward work and workers than those whose S.O.E. program have focused on School Land Laboratories.

H_0 : Michigan 1981-82 senior secondary vocational agriculture students in production agriculture whose S.O.E. programs focused on Farm or Agribusiness Placement will not have a higher level of positive attitudes toward work and workers than those whose S.O.E. programs have focused on School Land Laboratories.

$$H_1: \mu_1 \geq \mu_2$$

$$H_0: \mu_1 < \mu_2$$

$$\alpha = .05$$

The comparison of students' level of positive attitudes toward work and workers, between those students who focused on School Land Laboratory programs and the students who focused on Farm or Agribusiness Placement program, and the test for Hypothesis Six are summarized in Table 24. As indicated, the p-value is significant, so the researcher can conclude that there was enough evidence to be at least 95% confident that there was a statistically significant difference in the level of positive attitude toward work and workers, between the students who focused on the School Land Laboratories and the students who focused on the Farm or Agribusiness Placement program.

Table 24
Mean, Standard Deviation, and t-test Analysis of Differences for the
Level of Students' Positive Attitudes Toward Work and Workers by
the Kind of S.O.E. Program Which Students Focused
(N = 331)

Kind of S.O.E. Program	Mean	S.D.	t-value	P-value
School Land Laboratories	2.33	.89	2.13	.034
Farm or Agribusiness Placement Program	2.05	.96		

$$\alpha = .05$$

The mean score for students who focused on School Land Laboratory programs (2.33) was significantly higher than the mean score for students who focused on Farm or Agribusiness Placement program.

Therefore, the directional hypothesis H_1 is rejected and hypothesis H_0 which states that those students who focused on School Land Laboratories will have a higher level of positive attitude toward work and workers than those students who focused on Farm or Agribusiness Placement program can be accepted.

Hypothesis 7

H_1 : Michigan 1981-82 senior secondary vocational agriculture students in production agriculture whose S.O.E. program focused on Home Farm or Agribusiness Placement program will have a level of positive attitudes toward work and workers than those whose S.O.E. programs have focused on Home Farm Production program.

H_0 : Michigan 1981-82 senior secondary vocational agriculture students in production agriculture whose S.O.E. program have focused on Farm or Agribusiness Placement program will not have a level of positive attitudes toward work and workers than those whose S.O.E. programs have focused on Home Farm Production.

$$H_1: \mu_1 \geq \mu_2$$

$$H_0: \mu_1 < \mu_2$$

$$\alpha = .05$$

Table 25 presents mean score standard deviations, t-ratio and the p value for the two groups of students who focused on Home Farm Production S.O.E. programs and Farm or agribusiness placement for the factor, level of positive attitudes toward work and workers.

Table 25
Mean, Standard Deviation, and t-test Analysis of Differences for the
Level of Students' Positive Attitudes Toward Work and Workers by
the Kind of S.O.E. Program Which Students Focused
(N=331)

Kind of S.O.E. Program	Mean	S.D.	T-ratio	P-ratio
Home Farm Production	1.87	.87	-1.49	.137
Farm or Agribusiness Placement Program	2.05	.96		

$\alpha = .05$

These findings revealed that the P-value is not significant, there is not enough evidence to be 95% confident that the level of positive attitude toward work and workers between students who focused on Home Farm Production and students who focused on Farm or Agribusiness Placement programs. Thus, the hypothesis H_0 which indicated that those students who focused on Home Farm Production will have a higher level of positive attitudes toward work and workers than those who focused on Farm or Agribusiness Placement program is rejected.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

Supervised Occupational Experience (S.O.E.) programs are an essential part of vocational education in agriculture. It is a method of providing vocational agriculture students with real life experiences essential to work in agricultural occupations. Effective S.O.E. programs take vocational agriculture students into the community where their supervisors, parents, teachers, and employers have an opportunity to observe and participate in the teaching-learning process. They are in a position to impart meaningful information and experiences to youth which can be relevant to their career aspirations in agriculture. Such information and experiences can be provided by supervisors of vocational agriculture students through S.O.E. programs (Rawls, 1981; Rawls, 1982; Rawls and Williams, 1979). Learning by doing in the field of vocational agriculture involves non-traditional teaching that includes systematic instruction and supervision outside the classroom. It has been recognized by supervisors that S.O.E. programs assist vocational agriculture students in the identification of an agricultural occupation and develop those skills essential in entering and making satisfactory progress in an agricultural occupation. Morton (1980) concluded in his study that both opportunity and quality of S.O.E. programs are more important for achievement of technical

knowledge than the number of supervisory visits by the vocational agriculture teacher. An Iowa study (Rawls, 1982) reported that a significant relationship ($P \leq .001$) existed between work attitudes and human relations with fellow workers and supervisors.

The Problem

Statewide data did not exist in Michigan on the perceived competencies in production agriculture of vocational agriculture students who were enrolled in various types of S.O.E. programs. These data are important for the development of effective educational and professional development programs to better serve employers, teachers, parents, students, and society.

Based on the fundamental assumption that agricultural education programs should aid students in the achievement of a variety of technical competencies, this study was initiated to identify the relationship between:

The agricultural competencies attained by students enrolled in vocational agriculture as measured through a specification of performance objectives in production agriculture, and

1. The focus of their S.O.E. Programs on;
 - a. Farm and agribusiness placement,
 - b. School land laboratories, or
 - c. Home farm production, and
2. Their place of residence;
 - a. On a farm or
 - b. In a town or non-farm area.

Research Procedures

The survey instrument and all correspondence were developed by the researcher. Items were developed in three parts to get descriptive information about the vocational agriculture students' types of S.O.E. programs focused on by these students, the students' places of residence, students' attitudes toward work and workers, and to obtain the students' perceptions of the technical competencies they had developed in production agriculture.

This research study was conducted using a sample of Michigan high school students enrolled in vocational agriculture, production agriculture, who were participating in S.O.E. programs and classified as seniors during the 1981-82 school year. Through a systematic random sampling procedure, 43 schools were identified to participate in this study. A total of 331 students in 41 schools responded to the data collection procedures correctly, and statistical tests were used on the data provided by these students.

A three-part questionnaire was developed to collect personal data about the students; to determine the level of perceived competence of students in production agriculture, to recognize the type of S.O.E. program on which the students focused as a part of their instructional program, and to determine the students' level of attitudes toward work and workers. The data were collected by mailed questionnaires during the spring of 1982.

The data were analyzed to:

1. Determine the number and frequency of responses in terms of

selected personal characteristics of students based on their type of S.O.E. programs and their home location.

2. Determine if significant relationships existed between selected personal characteristics of students and
(a) students' type of S.O.E. program, and (b) students' home location.
3. Determine if significant differences existed in the students' perceived level of competence in production agriculture and
(a) the focus of their S.O.E. programs, and (b) their place of residence.

Conclusions

Based on responses from the 331 students participating in this study, the following conclusions for vocational agriculture students in production agriculture in Michigan can be stated:

1. The largest number of students in the survey sample (129, 38.9 percent) had participated in S.O.E. programs that focused on home farm production.
2. Nearly as many students had participated in S.O.E. programs (109, 32.9 percent) that focused on school land laboratory program.
3. A slightly smaller number of students had participated in S.O.E. programs (93, 28.1 percent) that focused on farm or agribusiness placement programs.
4. Almost two-thirds of the students in the survey (64.9 percent) reported that their fathers had not enrolled in

vocational agriculture during high school, and there was a significant relationship between the students' type of S.O.E. program and his/her father's enrollment in vocational agriculture (at the .05 level of significance).

5. More than three-fourths of the students in the survey sample (76.5 percent) were F.F.A. members. Almost three-fourths of the students (71.9 percent) had earned an F.F.A. degree of some kind. Slightly less than one-half (45.5 percent) had earned a Chapter Farmer degree. A significant relationship existed between a student's type of S.O.E. program, and his/her F.F.A. membership (at the .05 level of significance).
6. Slightly more than four-fifths of the respondents (80.4 percent) in the sample population were enrolled four semesters or more in vocational agriculture programs. There was a significant relationship between the number of semesters students were enrolled in vocational agriculture programs and the type of S.O.E. program on which the students focused.
7. A Chi-square analysis revealed that a significant relationship existed between student's type of S.O.E. programs and their attitudes toward work and workers. More than two-thirds of the students (68.5 percent) had a positive or very positive attitude toward work and workers; and only 6.7 percent of the total respondents had negative or very negative attitudes. In this study, only two of all the respondents (331) reported a very negative attitude toward work and workers.
8. A Chi-square analysis revealed that a significant relationship

existed (at .05 level of significance) between students' place of residence and student's fathers' enrollment in vocational agriculture during high school.

9. Nearly all of the students (82.2 percent) who participated in S.O.E. programs that focused on home farm production indicated that they were from farms. Less than one-fourth of the total respondents (22 percent) who focused on school land laboratory programs were from a farm, the remainder (78.0 percent) were from a town, city or non-farm area.
10. The home farm production program had the highest percentage of students (73.6 percent) with positive or very positive attitudes toward work and workers. This was followed closely by farm or agribusiness placement program with 70.9 percent of the students reporting positive or very positive attitudes. The school land laboratories had a slightly smaller percentage of students with positive or very positive attitudes toward work and workers (60.9 percent).
11. Results of a Chi-square analysis revealed that a significant relationship existed between students' F.F.A. membership and their places of residence. More than eighty-two percent of the students who lived on a farm were F.F.A. members.
12. Over four-fifths of the respondents (81.9 percent) who lived on a farm had earned an F.F.A. degree. Of these respondents who earned an F.F.A. degree, over 60 percent (63.4 percent) had earned the Chapter Farmer degree.

13. Slightly less than three-fourths of the total respondents who lived in a town or a non-farm area (72.6 percent) were enrolled seven semesters or less in vocational agriculture programs. But, more than one-half of the students who had lived on a farm (52.6 percent) were enrolled eight semesters or more in vocational agriculture.
14. A Chi-square analysis revealed that a significant relationship existed between students' place of residence and students' level of positive attitudes toward work and workers. Slightly less than four-fifths of the total students who lived on a farm had a positive or very positive attitude toward work and workers.
15. Results of a one-way analysis of variance (Table 17) revealed that there was enough evidence to be at least 95% confident that a given students' perceived competence in production agriculture depends on the type of S.O.E. program on which he/she focused. By using the t-test, significant differences between all the possible pairs of groups mean scores were tested.

a - Results of the t-test (Table 18) revealed that there was not enough evidence to be at least 95% confident that a given student's perceived competence in production agriculture depends on groups of students who focused on the school land laboratory and students who focused on home farm production. Therefore, it was concluded that in Michigan there was no significant difference in the level of perceived competence in

production agriculture between the students who focused on the school land laboratory and the students who focused on home farm production.

b - Results of the t-test (Table 19) revealed that there was enough evidence to be at least 95% confident that a given student's perceived competence in production agriculture depends on the groups of students who focused on school land laboratories and those who focused on farm or agribusiness placement programs. The mean score of perceived competences in production agriculture programs for students who focused on farm or agribusiness placement programs was significantly higher than for students who focused on school land laboratories. Therefore, it was concluded that vocational agriculture students in Michigan who focused on farm or agribusiness placement programs had a higher level of perceived competence in production agriculture than those students who focused on school land laboratories.

c - Result of the t-test (Table 20) revealed that, there was enough evidence to be at least 95% confident that a given student's perceived competence in production agriculture depends on the groups of students who focused on home farm production and the students who focused on farm or agribusiness placement programs. The mean score of perceived competencies in production agriculture programs for students who focused on farm or agribusiness placement programs was significantly higher than for students who focused on home

farm production. So, vocational agriculture students in Michigan who focused on farm or agribusiness placement program had a higher level of perceived competence in production agriculture than those students who focused on home farm production.

16. Results of the t-test (Table 21) revealed that there was enough evidence to be at least 95% confident that a given student's perceived competence in production agriculture depends on their place of residence (a- rural farm or, b- town, city or non-farm area). The mean of perceived competence in production agriculture for students who lived in a rural farm was significantly higher than those students who lived in a town, city or non-farm area. Therefore, vocational agriculture students in Michigan who were from a rural farm area had a higher level of perceived competence in production agriculture than those students who were from town, city or non-farm area.

17. Results of a one-way analysis of variance (Table 22) revealed that there was enough evidence to be at least 95% confident that a given student's attitudes toward work and workers depends on the type of S.O.E. program on which he/she focused. By using the t-test, significant differences between all the possible pairs of the groups' mean scores were tested.

a - Results of the t-test (Table 23) revealed that there was enough evidence to be at least 95% confident that there was significant differences on the level of positive attitudes

toward work and workers, between the students who focused on school land laboratories and the students who focused on home farm production programs. The mean level of positive attitudes toward work and workers for students who focused on school land laboratories was significantly higher than for students who focused on home farm production programs. Therefore, vocational agriculture students in Michigan who focused on school land laboratories had a higher level of positive attitudes toward work and workers than those students who focused on home farm production programs.

b - Results of the t-test (Table 24) revealed that there was enough evidence to be at least 95% confident that there was a significant difference on level of the positive attitudes toward work and workers between the students who focused on school land laboratories and those who focused on farm or agribusiness placement programs. The mean level of positive attitudes toward work and workers for students who focused on school land laboratories was significantly higher than for students who focused on farm or agribusiness placement programs. Therefore, it was concluded that vocational agriculture students in Michigan who focused on school land laboratories had a higher level of positive attitudes toward work and workers than those students who focused on farm or agri-business placement programs.

c - Results of the t-test (Table 25) revealed that there

significant difference on the level of positive attitudes toward work and workers between the students who focused on the home farm production and farm or agri-business placement programs. Therefore, it was concluded that in Michigan there was no significant difference in the level of the positive attitudes toward work and workers between the students who focused on home farm production and farm or agribusiness placement programs.

Recommendations

The findings of this research study disclosed that relationships did not exist between some personal variables and a) the type of S.O.E. programs on which students had focused, and b) students' place of residence. The research also revealed differences among groups of students (based on types of S.O.E. program), and a) the level of perceived competence in production agriculture, and b) the level of positive attitude toward work and workers. There were differences among groups of students on their level of perceived competence in production agriculture based on their place of residence.

Based on the findings of this research study the following recommendations were made to those who are responsible for planning, implementing, conducting, evaluating or improving Supervised Occupational Experience programs as an integral part of secondary vocational agriculture programs in Michigan:

1. Significant differences existed among students grouped according to their type of S.O.E. programs based on their

according to their type of S.O.E. programs based on their level of perceived competence in production agriculture. It is recommended that S.O.E. programs for students enrolled in vocational production agriculture in Michigan secondary schools should focus on farm or agribusiness placement. Students who focused on farm or agribusiness placement program had a significantly higher level of perceived competence.

2. Almost all of the students (92.2 percent) participating in this study with S.O.E. programs that focused on home farm production indicated that they were from rural farms. Therefore, it is recommended that home farm production programs should continue to serve as S.O.E. programs for students who are from rural farm areas, and are planning to enter occupations in agriculture.
3. Almost four-fifths of the total respondents (78.0 percent) who focused on school land laboratory programs were from a town, city, or non-farm area. Therefore, it is recommended that school land laboratories should continue to serve as S.O.E. programs for vocational agriculture.
4. Fifty-six percent of the total sample population in this study lived on a farm. Therefore, it is recommended that students' home farm should be utilized to provide opportunity for the development of competencies for employment in agriculture.
5. A large number of students (68.5 percent) who were in S.O.E. programs had positive or very positive attitudes toward work

and workers. Therefore, it is recommended that a) motivating students for entry into an agriculture occupation should be continued as a major focus of vocational agriculture programs in Michigan, and b) supervised occupational experience programs should continue as a vital part of vocational agriculture programs.

6. Significant differences in perceived competence in production agriculture according to their place of residence. Therefore, it is recommended that vocational agriculture instructors should design instruction to compensate for differences in learning due to place of residence.
7. More than three-fourths of the students in the survey sample (76.5 percent) were F.F.A. members, and almost three-fourths of the students (71.9 percent) were holding an F.F.A. degree. Based on the literature review, it is recommended that more emphasis should be given to help vocational agriculture students to understand the relationship between S.O.E. programs and F.F.A. activities.
8. Based on the review of related literature, since the most satisfactory supervised occupational programs are developed as a result of proper teacher, parent, employer relationships, it is recommended that: a) the development of desirable relationships should be the duty of every instructor of vocational agriculture in Michigan, b) the objectives and the educational value of S.O.E. programs must be carefully explained to vocational agriculture students, parents, farmers

and agribusinessmen by every instructor in Michigan, and c) the S.O.E. Program planning, development, and evaluation efforts should involve parents, farmers and agribusinessmen.

Recommendations for Further Research

The following recommendations for further research in Michigan are based on the findings of this research study:

1. There is a need for similar studies to be conducted using other dependent measures, such as a) the quality of job placement activities of vocational agriculture students, and b) the level of positive attitudes toward work and workers of students' supervisors who are enrolled in different types of S.O.E. programs.
2. The need exists to examine the influence of the length of supervised job placement experience on successful employment. With extensive supervised job placement experience, do graduates have greater success in the labor market? Do employers perceive these students as being more qualified for entry jobs? Would students perceive greater technical competence?
3. Since a high percentage of vocational agriculture students surveyed not only participated in an S.O.E. program, but also were participants in an F.F.A. program, a study should be made to determine what impact a high quality F.F.A. program has on students' technical competence.
4. Additional research is needed to find out why the level of

positive attitudes toward work and workers for those students who focused on school land laboratories was higher than those students who focused on other types of S.O.E. programs.

5. Since the primary purpose of S.O.E. programs is to provide students an opportunity to achieve competencies that could not be developed at any other time, research should examine student achievement in relation to length of program. Is learning influenced by the length of an S.O.E. program?
6. Since there was a significant relationship between the enrollment of a student's father in vocational agriculture and the type of S.O.E. program on which the student focused (Table 4), the nature of the relationship should be investigated.
7. Since there was a significant relationship between a student's type of S.O.E. program and his/her F.F.A. membership (Table 5), the nature of the relationship should be investigated.
8. Since there was a significant relationship between a student's type of S.O.E. program and the kind of F.F.A. degree earned, the need exists to investigate the nature of the relationship.
9. Since there was a significant relationship between a student's type of S.O.E. program and the number of semesters in which he/she was enrolled in a vocational agriculture program, there is a need to investigate the nature of the relationship.
10. Since there was a significant relationship between a) a student's place of residence and his/her father's enrollment in vocational agriculture during high school, b) his/her F.F.A. membership, c) his/her type of F.F.A. degree earned,

and d) the number of semesters in which he/she was enrolled in a vocational agriculture program, there is a need to investigate the nature of each of these relationships.

11. The relationship between a vocational agriculture student's work values and a) his/her vocational agriculture teacher's attitudes, b) his/her parent's work values and c) his/her involvement on farms or in agribusiness should be investigated.
12. There is a need to assess the impact of S.O.E. programs on other areas of personal and technical achievement.
13. Additional research is needed to examine the cost effectiveness of various types of the S.O.E. programs in vocational agriculture.

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APPENDIX A

CORRESPONDENCE WITH MICHIGAN
VOCATIONAL AGRICULTURE TEACHERS
AND STUDENTS

COOPERATIVE
EXTENSION
SERVICE

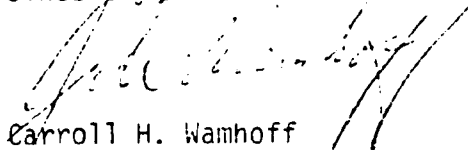
MICHIGAN STATE UNIVERSITY · U.S. DEPARTMENT OF AGRICULTURE & COUNTIES COOPERATING
OFFICE OF THE DIRECTOR · EAST LANSING, MICHIGAN 48824

April 23, 1982

To Selected Teachers:

Thank you for participating in this study. It is a part
of the total research effort in Agricultural and Extension
Education at Michigan State University.

Sincerely,



Carroll H. Wamhoff
Director, Agriculture and
Natural Resources Education Institute

CHW:mee



(517) 355-6580

410 Agriculture Hall
Michigan State University
East Lansing, Michigan 48824

MSU is an Affirmative Action / Equal Opportunity Institution



Agriculture and Natural Resources Education Institute
410 Agriculture Hall (517) 355-6580
Michigan State University East Lansing, Michigan 48824

April 23, 1982

Williamston High School
Peter Zaldokas
3845 Vanneter Road
Williamston, MI 48895

Dear Mr. Zaldokas:

I understand that you teach a senior student vocational agriculture class this spring. Because you are a teacher of senior students in vo-ag, I am asking that you participate in a study to help develop and improve the Supervised Occupational Experiences which many high school students get through vocational agriculture. Will you please help by completing the enclosed questionnaire and helping senior vo-ag students to complete parts II and III of the questionnaire?

Dr. Harry Gardner and the ANRE Faculty at Michigan State University are working with me on this study.

Supervised Occupational Experience (S.O.E.) Programs may be defined as a vocational agriculture student's planned participation in one or more agricultural occupations. Some authors, such as David L. Williams, may refer to such experience as a student's F.F.A projects. There are several kinds of S.O.E. Programs, including farm or agri-business placement programs, school land laboratories, and home/farm production (S.O.E) Programs when performed in addition to regular class activities.

Please read the statements of information, definitions and instructions at the beginning of the questionnaire and explain Parts II and III of the questionnaire to your senior students enrolled in vo-ag. You may call Dr. H. Gardner (517) 355-6580, or Daryoush Shahrakh (517) 332-6521 if you have questions concerning your participation in the study.

Please complete the questionnaire carefully and honestly, following the directions for each part. The completed questionnaire can be returned by mail in the enclosed self-addressed, stamped envelope.

Thank you for your help to further develop and improve Supervised Occupational Experience Programs in the State of Michigan.

April 23, 1982
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Sincerely,



Daryoush Shahrakh
Graduate Student in
Ag Ed
Michigan State University



Dr. Harry Gardner, Program Leader
Agriculture and Natural Resources
Education
Michigan State University



Agriculture and Natural Resources Education Institute
410 Agriculture Hall (517) 355-6580
Michigan State University East Lansing, Michigan 48824

April 23, 1982

Dear Student:

I understand that you will graduate from high school this spring and are currently enrolled in a vo-ag class. Because you are a high school senior in vo-ag, I am asking that you participate in a study to help develop and improve the Supervised Occupational Experience (S.O.E) Programs which many high school students get through vo-ag. Will you please help by completing the enclosed questionnaire?

Please read the statements of information, definitions and instructions at the beginning of Parts Two and Three of the questionnaire.

1. First, answer the nine short-answer questions on Part II of the questionnaire.
2. Secondly, respond to each competency statement in Part III. Rate your perceived level of competence by placing a check mark in the appropriate column on the questionnaire using the Rating Scale. If you have any questions, you may ask your vo-ag teacher.

Please complete the questionnaire carefully and honestly, following the directions for each part. The completed questionnaire can be returned to your vo-ag teacher.

Thank you for your help to further develop and improve S.O.E. Programs and vocational agriculture.

Sincerely,

Daryoush Shahrakh
Graduate Student in
Ag. Ed. at
Michigan State University

Dr. Harry Gardner, Program Leader
Agriculture and Natural Resources
Education
Michigan State University

APPENDIX B

SURVEY INSTRUMENT

A Study of the Agricultural Competencies of Senior VO-AG Students in Michigan, Based on Their S.O.E. Programs

PART I: Questionnaire for VO-AG Teachers

Your Name _____ School Name _____

Office Telephone Number _____

This part of the questionnaire was developed to obtain from VO-AG teachers data in regard to (1) the major focus of S.O.E. programs in which the students were involved (a-farm or agri-business placement program, b-school land laboratories, and c-home farm production), (2) the place of residence of each student (a-farm or b-non farm), and (3) the student's general attitudes toward work and fellow workers.

Definition of the Term "Focus"

A student may have participated in S.O.E. activities on the school land lab, and he/she may have been placed on a neighbor's farm for a few weeks or months. This student may have had an S.O.E. program on the home farm, also. Determine in which of these three areas the student was provided most (the focus) of his/her S.O.E. program experience.

Definition of "Farm"

As defined for the U. S. Census of 1970, all persons not of the urban population and residing on farms of ten or more acres from which the sales of farm products amounted to \$50 or more the previous year, or residing on farms of less than ten acres from which such sales amounted to \$250 or more.

Instruction

Please list (a) each of your senior students' names who are enrolled in production agriculture, (b) the major focus of each student's S.O.E. program by checking the appropriate box, (c) your assessment of each student's attitude toward work and workers, and (d) each student's place of residence.

[illegible]

PART II: Questionnaire for VO-AG Students

This section of the questionnaire was developed to obtain data from senior vocational-agricultural students, including personal information and a description of the major focus of the respondent's S.O.E. Program

Instructions

Please respond to each item by writing in the information requested or checking the appropriate response for each question.

1. Name: _____
2. Address: _____
3. Telephone number: _____
4. How many semesters of high school vocational-agriculture have you completed?
5. Did your father enroll in VO-AG during high school? Yes _____ No _____
6. Are you an FFA member? Yes _____ No _____
7. Do you have an FFA degree? Yes _____ No _____
8. If yes, what was your highest FFA degree?
 - a. Green hand degree _____
 - b. Chapter farmer degree _____
 - c. State farmer degree _____
 - d. American farmer degree _____

PART III

This section of the questionnaire contains competency statements randomly selected to represent the range of performance objectives a secondary vocational-agriculture instructor may be teaching. This is not a right and wrong answer test. Do not be concerned about your score. Provide the most accurate picture of yourself by responding to every item. You will be less experienced in some of the areas than in others. This is normal. But, please complete each item to assist in providing accurate data.

Instructions

As you read each statement carefully, consider whether or not it was part of your program. If not, check "I have not been taught this," and go on to the next competency statement. If you were taught the competency, rate your perceived level of competency by placing a check mark in the appropriate column.

Rating Scale

1. I cannot do this.
2. I can do this if somebody helps me.
3. I can do this by myself.
4. I could show others how to do this.
5. I have not been taught this.

	cannot do	can do with help	can do by myself	can show others how	have not been taught
1. I can identify, select, and rank a group of cattle for production of breeding stock or feeders _____					
2. I can identify, select, and rank a group of dairy animals _____					
3. I can identify, select, and rank a group of birds for specific production purposes _____					
4. I can identify, select, and rank a group of breeding sheep for specific production purposes _____					
5. I can identify, select, and rank a group of swine for specific production purposes _____					
6. I can name the primary parts and identify the functions of the reproductive system of plants _____					
7. I can determine the expected date of birth or hatching of various farm animals or birds _____					
8. I can compare and evaluate efficiency and economics of materials handling systems _____					
9. I can perform such pertinent skills as castrating, dehorning, ringing, docking, and deheading _____					
10. I can recognize the function of and plan the efficient use of feed additives _____					
11. I can interpret the results of a computer print out _____					
12. I can identify the alternative systems for marketing farm animals _____					
13. I can grade eggs _____					
14. I can determine when and how to market milk _____					
15. I can categorize each plant and weed on a list as to whether it is a winter or spring annual _____					

	cannot do	can do with help	can do by myself	can show others how	have not been taught
16. I can identify plant nutrient deficiencies from both major and micro nutrients which affect a particular Michigan agricultural field crop _____					
17. I can determine when crops are ready to be harvested _____					
18. I can state the optimum time of planting for a particular crop _____					
19. I can recommend the crop and crop variety for a farm in my home country _____					
20. I can choose the three most nearly ideal seed bed situations for a given crop _____					
21. I can determine optimum row width, seeding rate, depth of seed, fertilizer placement, and proper seed treatment for each crop grown in my home country _____					
22. I can recommend proper amounts of chemical weed control for a specific weed _____					
23. I can identify several common forms of seeds and plants _____					
24. I can identify insect problems, tell if control is necessary, and make a recommendation for controlling each problem _____					
25. I can determine the quantity of each analysis of fertilizer needed to most nearly meet recommended fertilizer requirements per acre for each crop in my home country _____					
26. I can balance a farm account _____					
27. I can secure a farm loan and make regular payments on interest and principal _____					
28. I can list the five steps in producing and marketing a commodity _____					
29. I can list three livestock grading systems _____					
30. I can list and explain the functions and purposes of three local government agencies such as A.S.C., C.P.A., and F.H.A. _____					
31. I can fill out a standard farm agreement or contract correctly _____					
32. I can explain the purposes of a "will" _____					
33. I can write a legal description of a given acreage of land or locate areas and give acreage in a plot book _____					
34. I can list at least ten laws affecting the employment of a minor student _____					
35. I can complete the U. S. tax forms, 1040 and Schedule F, using a farm record book _____					
36. I can identify a two- and a four-cycle engine _____					
37. I can disassemble, inspect, and reassemble properly the ignition components of a battery or magneto system _____					
38. I can disassemble and display parts in an orderly manner, inspect and repair or replace worn parts and reassemble a carburetor _____					
39. I can identify these parts: head, stem, face, margins, retainers, exhaust springs, intake spring, and valve guides _____					
40. I can perform the daily preventive maintenance skills for an engine _____					
41. I can select arc welding and oxyacetylene welding safety equipment that will adequately protect my eyes, skin, and clothing from burns _____					
42. I can turn on, select, correct operating pressures, light and adjust the flame, and turn off oxyacetylene welding and cutting equipment _____					
43. I can demonstrate the safe use and maintenance procedure in using a circular saw, electric drill, and jigsaw or sabre saw _____					
44. I can cut thread and install steel pipe and form a stationary "tee" or 90 elbow, a union reducing from 3/4" to 1/2" and a stationary automatic water bucket or similar unit _____					
45. I can layout the corners of a 40' x 50' rectangle _____					
46. I can identify the internal parts of a farm tractor _____					
47. I can time the ignition system of a tractor _____					
48. I can remove and replace the fuel tank, lines, and filters, check the system for leaks and damage, and make necessary repairs of a tractor _____					
49. I can both remove and replace the thermostat and check the complete unit for leaks on a tractor _____					
50. I can identify the parts of selected farm implements based on the operator's manual _____					
51. I can inspect and replace worn parts of a weed sprayer _____					
52. I can adjust a trailer, mounted or semi-mounted plow _____					

APPENDIX C

MEAN, STANDARD DEVIATION, AND ANALYSIS OF VARIANCE
FOR THE LEVEL OF STUDENTS' PERCEIVED COMPETENCE
IN PRODUCTION AGRICULTURE (IN 52 COMPETENCIES)
BY THE 1-STUDENTS' TYPE OF S.O.E. PROGRAM,
OR 2-STUDENTS' PLACE OF RESIDENCE.

If the t-value is not significant, there is not enough evidence to be 95% confident that a given student's perceived competence in production agriculture depends on his/her place of residence.

If the t-value is significant, there is enough evidence to be at least 95% confident that a given student's perceived competence in production agriculture depends on his/her place of residence. Further, in the case of a significant t-value, the larger mean value implies higher perceived competence for that place of residence.

Table C1
Mean, Standard Deviations and t-test Analysis of Differences for Students'
Perceived Competency Statements (The Performance Objectives a Secondary
Vocational Agriculture Instructor May be Teaching) by Their
Place of Residence.
(N=331)

Competency Statement	Place of Residence	Mean/S.D.	t-Value	P-Value
1-I can identify, select, and rank a group of cattle for production of breeding stock or feeders	FARM	2.70/ 1.06		
	Not on FARM	3.18/ 1.43	-3.50	.001
2-I can identify, select, and rank a group of dairy animals.	FARM	2.77/ .98		
	Not on FARM	3.13/ 1.38	-2.73	.007
3-I can identify, select, and rank a group of birds for specific production purposes.	FARM	3.15/ 1.67		
	Not on FARM	3.17/ 1.59	- .16	.889*
4-I can identify, select, and rank a group of breeding sheep, for specific production purposes.	FARM	3.36/ 1.58		
	Not on FARM	3.29/ 1.78	.24	.813*
5-I can identify, select, and rank a group of swine for specific production purposes.	FARM	2.91/ 1.19		
	Not on FARM	3.22/ 1.49	-2.09	.037
6-I can name the primary parts and identify the functions of the reproduction system of plants.	FARM	2.63/ 1.12		
	Not on FARM	2.70/ 1.25	- .56	.587*
7-I can determine the expected date of birth or hatching of various farm animals or birds.	FARM	3.14/ 1.09		
	Not on FARM	3.12/ 1.59	.17	.867*

Table C1
Continued

Competency Statement	Place of Residence	Mean/S.D.	t-Value	P-Value
8-I can compare and evaluate efficiency and economics of material handling systems.	FARM	3.10/ 1.25		
	Not on FARM	3.31/ 1.62	-1.32	.189
9-I can perform such pertinent skills as castrating, dehorning, ringing, docking, and deheading.	FARM	2.93/ 1.08		
	Not on FARM	3.23/ 1.41	-2.16	.003
10-I can recognize the function of and plan the efficient use of feed additives.	FARM	2.81/ 1.12		
	Not on FARM	2.99/ 1.44	-1.25	.211*
11-I can interpret the results of computer print out.	FARM	3.51/ 1.53		
	Not on FARM	3.19/ 1.71	1.79	.074*
12-I can identify the alternative systems for marketing farm animals.	FARM	3.04/ 1.34		
	Not on FARM	3.27/ 1.53	-1.48	.146*
13-I can grade eggs.	FARM	3.45/ 1.50		
	Not on FARM	3.53/ 1.49	- .47	.636*
14-I can determine when and how to market milk.	FARM	3.08/ 1.42		
	Not on FARM	3.53/ 1.61	-2.69	.007*
15-I can categorize each plant and weed on a list as to whether it is a winter or spring annual.	FARM	2.60/ 1.34		
	Not on FARM	2.95/ 1.46	-2.28	.023
16-I can identify plant nutrient deficiencies which affect a particular Michigan agricultural field crop.	FARM	2.63/ 1.33		
	Not on FARM	2.75/ 1.52	- .75	.451*

Table C1
Continued

Competency Statement	Place of Residence	Mean/S.D.	t-Value	P-Value
17-I can determine when crops are ready to be harvested.	FARM	3.08/ .69		
	Not on FARM	3.02/ 1.03	.66	.522*
18-I can state the optimum time of planting for a particular crop.	FARM	2.86/ .85		
	Not on FARM	2.75/ 1.30	- .90	.369*
19-I can recommend the crop and crop variety for a the crop and farm in any home country.	FARM	2.79/ .89		
	Not on FARM	2.92/ 1.42	- .97	.334*
20-I can choose the three most nearly ideal seed bed situations for a given crop.	FARM	2.72/ 1.03		
	Not on FARM	3.06/ 1.55	-2.32	.021
21-I can determine optimum row width seeding, rate, depth of seed, fertilizer placement, and proper seed treatment for each crop grown in my home country.	FARM	2.68/ .96		
	Not on FARM	2.64/ 1.36	-1.27	.206*
22-I can recommend proper amounts of chemical weed control for a specific weed.	FARM	2.59/ 1.21		
	Not on FARM	2.97/ 1.54	-2.48	.014
23-I can identify several common forms of seeds and plants.	FARM	3.02/ .85		
	Not on FARM	2.78/ 1.08	2.20	.029

Table C1
Continued

Competency Statement	Place of Residence	Mean/S.D.	t-Value	P-Value
24-I can identify insect problems, tell if control is necessary, and make a recommendation for controlling each problem.	FARM	2.60/ 1.06		
	Not on FARM	2.81/ 1.43	-1.47	.144
25-I can determine the quality of each analysis of fertilizer needed to most nearly meet recommended fertilizer requirements per acre for each crop in my home country.	FARM	2.53/ 1.14		
	Not on FARM	2.96/ 1.56	-2.76	.006
26-I can balance a farm account.	FARM	2.91/ .94		
	Not on FARM	2.89/ 1.33	.12	.906
27-I can secure a farm loan and make regular payments on interests and principal.	FARM			
28-I can list the five steps in producing and marketing a commodity.	FARM	2.65/ 1.18		
	Not on FARM	3.13/ 1.54	-3.22	.001
29-I can list three livestock grading systems.	FARM	2.68/ 1.31		
	Not on FARM	3.09/ 1.56	-2.54	.011
30-I can list and explain the functions and purposes of three local government agencies such as A.S.C., C.P.A. and F.H.A.	FARM	2.75/ 1.39		
	Not on FARM	3.12/ 1.56	-2.22	.027

Table C1
Continued

Competency Statement	Place of Residence	Mean/S.D.	t-Value	P-Value
31-I can fill out a standrard farm agree-ment or contract correctly.	FARM	2.96/ 1.27		
	Not on FARM	3.16/ 1.58	-1.36	.175*
32-I can explain the purposes of a "will".	FARM	2.79/ .93		
	Not on FARM	3.11/ 1.25	-2.62	.009
33-I can write a legal description of a given acreage of land or locate areas and give acreage in a plot book.	FARM	2.45/ 1.18		
	Not on FARM	3.20/ 1.62	-2.87	.004
34-I can list at least ten laws affecting the employment of a minor student.	FARM	2.85/ 1.42		
	Not on FARM	2.94/ 1.50	- .54	.584*
35-I can complete the U.S. tax forms, 1040 and schedule F, using a farm record book.	FARM	2.92/ 1.01		
	Not on FARM	2.94/ 1.28	- .13	.897
36-I can identify a two - and a four cycle engine.	FARM	3.03/ 1.07		
	Not on FARM	3.22/ 1.09	-1.52	.129*
37-I can disassemble, inspect, and re-assemble properly the ignition components of a battery or magneto sytem.	FARM	2.94/ 1.25		
	Not on FARM	2.92/ 1.32	.19	.852*

Table C1
Continued

Competency Statement	Place of Residence	Mean/S.D.	t-Value	P-Value
38-I can disassemble and display parts in and orderly manner, inspect and repair or replace worn parts and re-assemble a carburetor.	FARM	3.01/ 1.21		
	Not on FARM	3.09/ 1.22	- .64	.525*
39-I can identify these face, margins, retainers, exhaust springs, intake spring, and value guides.	FARM	3.03/ 1.14		
	Not on FARM	2.92/ 1.16	1.11	.270*
40-I can perform the daily preventive maintenance skills for an engine.	FARM	3.20/ .41		
	Not on FARM	3.26/ 1.10	- .53	.599*
41-I can select arc welding and welding safety equipment that will adequately protect my eyes, skin and clothing from burns.	FARM	3.18/ .95		
	Not on FARM	3.41/ 1.07	-2.01	.045
42-I can turn on, select, correct operating pressures, light and adjust the flame and turn off oxyacetylene welding and cutting equipment.	FARM	3.26/ .96		
	Not on FARM	3.43/ 1.08	-1.92	.056*
43-I can demonstrate the safe use and maintenance procedure in using a circular saw, electric drill, and jigsaw or sabre saw.	FARM	3.23/ .91		
	Not on FARM	3.37/ 1.01	-1.27	.206*

Table C1
Continued

Competency Statement	Place of Residence	Mean/S.D.	t-Value	P-Value
44-I can cut thread and form a stationary "tee" or 90 elbo, a union reducing from 3/4" to 1/2" and a stationary automatic water bucket or similar unit.	FARM	3.17/ 1.16		
	Not on FARM			
45-I can layout the corners of a 60' x 50' rectangle.	FARM	3.10/ 1.15		
	Not on FARM	3.16/ 1.29	.44	.663
46-I can identify the parts of a farm tractor.	FARM	2.93/ 1.11		
	Not on FARM	2.96/ 1.28	- .24	.808*
47-I can time the ignition system of a tractor.	FARM	3.03/ 1.26		
	Not on FARM	2.93/ 1.35	.66	.510*
48-I can remove and explain the functions and replace the fuel tank, lines, and filters, check the system for leaks and damage, and make the necessary repairs of a tractor.	FARM	3.03/ 1.07		
	Not on FARM	3.11/ 1.18	- .58	.566*
49-I can both remove explain the functions and and replace the thermostate and check the complete unit for leaks on a tractor.	FARM	3.17/ 1.15		
	Not on FARM	3.22/ 1.22	- .38	.704*

Table C1
Continued

Competency Statement	Place of Residence	Mean/S.D.	t-Value	P-Value
50-I can identify the parts of selected farm implements based on the operator's manual.	FARM	3.10/ .96		
	Not on FARM	3.24/ 1.17	-1.21	.255*
51-I can inspect and replace worn parts of a weed sprayer.	FARM	3.05/ 1.06		
	Not on FARM	3.17/ 1.30	- .96	.346*
52-I can adjust a trailer mounted or semi-mounted plow.	FARM	3.00/ 1.02		
	Not on FARM	3.13/ 1.25	-1.10	.2.71*

*-Significant at $\alpha = .05$

If the F-ratio is not significant, there is not enough evidence to be 95% confident that a given student's perceived competence in production agriculture depends on the type of S.O.E. program on which he/she had focused. If the F-ratio is significant, there is enough evidence to be at least 95% confident that a given student's perceived competence in production agriculture depends on the type of S.O.E. program on which he/she focused. For competence with a significant F-ratio, t-tests were carried out to compare means. Means preceded by different letters are significantly different.

For example in Competency Statement number one, there is enough evidence to be at least 95% confident that a given student's perceived competency in production agriculture depends on the focus of his/her S.O.E. program (School Land Laboratories or a Home Farm Production program, a-a), and (School Land Laboratories or a Farm or Agribusiness Placement program, b-b).

Table C2
Means, Standard Deviations and Analysis of Variance for Students'
Perceived Competency Statements (The Performance Objectives
a Secondary Vocational Agriculture Instructor
May be Teaching) and the Focus of Their
Type of S.O.E. Program.
(N=331)

Competency Statement	Focus on S.O.E.P.		Mean/S.D.	F-ratio	Sign
1-I can identify, select, and rank a group of cattle for production of breeding stock or or feeders	Land Laboratory Home Production Agribusiness	ab a b	3.31/ 1.49 2.71/ 1.08 2.76/ 1.09	7.99	.001
2-I can identify, select, and rank a group of dairy animals.	Land Laboratory Home Production Agribusiness	ab a b	3.33/ 1.45 2.63/ .90 2.87/ 1.04	10.87	.001
3-I can identify, select, and rank a group of birds for specific production purposes.	Land Laboratory Home Production Agribusiness	a a 3.15/ 1.52	3.44/ 1.63 2.94/ 1.70 3.15/ 1.52	2.81	.062
4-I can identify, select, and rank a group of breeding sheep, for specific production purposes.	Land Laboratory Home Production Agribusiness	a ac c	3.68/ 1.73 2.96/ 1.55 3.40/ 1.65	6.03	.003
5-I can identify, select, and rank a group of swine for specific production purposes.	Land Laboratory Home Production Agribusiness	a ac c	3.61/ 1.53 2.71/ 1.10 3.11/ 1.28	8.18	.001
6-I can name the primary parts and identify functions of the re-production system of plants.	Land Laboratory Home Production Agribusiness		2.80/ 1.20 2.49/ 1.15 2.73/ 1.17	2.17	.116
7-I can determine the expected date of birth or hatching of various farm animals or birds.	Land Laboratory Home Production Agribusiness		3.30/ 1.67 3.01/ 1.11 3.17/ 1.17	1.33	.265
8-I can compare and evaluate efficiency and economics of material handling systems.	Land Laboratory Home Production Agribusiness		3.24/ 1.61 3.20/ 1.28 3.17/ 1.39	.066	.936

Table C2
Continued

Competency Statement	Focus on S.O.E.P.		Mean/S.D.	F-ratio	Sign
9-I can perform such pertinent skills as castrating, dehorning, ringing, docking, and deheading.	Land Laboratory	ab	3.36/ 1.50	4.86	.008
	Home Production	a	2.86/ 1.04		
	Agribusiness	b	3.01/ 1.10		
10-I can recognize the function of and plan the efficient use of feed additives.	Land Laboratory	ab	3.19/ 1.51	4.07	.018
	Home Production	a	2.78/ 1.15		
	Agribusiness	b	2.73/ 1.08		
11-I can interpret the results of computer print out.	Land Laboratory		3.39/ 1.66	.908	.404
	Home Production		3.49/ 1.60		
	Agribusiness		3.19/ 1.60		
12-I can identify the alternative systems for marketing farm animals.	Land Laboratory	ab	3.55/ 1.51	6.85	.001
	Home Production	a	3.03/ 1.38		
	Agribusiness	b	2.85/ 1.29		
13-I can grade eggs.	Land Laboratory		3.66/ 1.49	1.04	.352
	Home Production		4.43/ 1.55		
	Agribusiness		3.38/ 1.42		
14-I can determine when and how to market milk.	Land Laboratory	ab	3.66/ 1.60	5.22	.006
	Home Production	a	3.04/ 1.42		
	Agribusiness	b	3.16/ 1.50		
15-I can categorize each plant and weed on a list as to whether it is a winter or spring annual.	Land Laboratory		2.95/ 1.51	1.59	.204
	Home Production		2.65/ 1.39		
	Agribusiness		2.68/ 1.28		
16-I can identify plant nutrient deficiencies which affect a particular Michigan agricultural field crop.	Land Laboratory	a	2.99/ 1.53	4.20	.016
	Home Production	a	2.44/ 1.29		
	Agribusiness		2.71/ 1.39		
17-I can determine when crops are ready to be harvested.	Land Laboratory		3.08/ 1.09	.274	.760
	Home Production		3.01/ .68		
	Agribusiness		3.09/ .78		

Table C2
Continued

Competency Statement	Focus on S.O.E.P.		Mean/S.D.	F-ratio	Sign
18-I can state the optimum time of planting for a particular crop.	Land Laboratory Home Production Agribusiness		2.97/ 1.34 2.79/ .93 2.96/ .90	.871	.420
19-I can recommend the crop and variety for a farm in any home country.	Land Laboratory Home Production Agribusiness	ab a b	3.07/ 1.45 2.74/ .93 2.74/ .98	2.84	.059
20-I can choose the three most nearly ideal seed bed situations for a given crop.	Land Laboratory Home Production Agribusiness	a a	3.16/ 1.52 2.63/ 1.07 2.85/ 1.24	4.55	.011
21-I can determine optimum row width seeding rate, depth of seed, fertilizer placement, and proper seed treatment for each crop grown in my home country.	Land Laboratory Home Production Agribusiness		2.56/ 1.34 2.53/ 1.07 2.55/ 1.06	.022	.978
22-I can recommend proper amounts of chemical weed control for a specific weed.	Land Laboratory Home Production Agribusiness	a a	2.97/ 1.45 2.50/ 1.31 2.90/ 1.33	3.92	.021
23-I can identify several common forms of seeds and plants.	Land Laboratory Home Production Agribusiness	 c c	2.90/ 1.14 3.07/ .80 2.72/ .91	3.34	.036
24-I can identify insect problems, tell if control is necessary, and make a recommendation for controlling each problem.	Land Laboratory Home Production Agribusiness		2.74/ 1.43 2.57/ 1.06 2.82/ 1.23	1.10	.332

Table C2
Continued

Competency Statement	Focus on S.O.E.P.		Mean/S.D.	F-ratio	Sign
25-I can determine the the quality of each analysis of fertilizer needed to most nearly meet recommended fertilizer requirements per acre for each crop in my home county.	Land Laboratory	a	2.95/ 1.49	4.08	.018
	Home Production	a	2.45/ 1.21		
	Agribusiness		2.81/ 1.31		
26-I can balance a farm account.	Land Laboratory		3.16/ 1.34	3.17	.043
	Home Production		2.83/ .97		
	Agribusiness		2.80/ 1.03		
27-I can secure a farm loan and make regular payments on interest and principal.	Land Laboratory	ab	3.36/ 1.51	11.16	.001
	Home Production	a	2.52/ 1.20		
	Agribusiness	b	2.75/ 1.29		
28-I can list the five steps in producing and marketing a commodity.	Land Laboratory	ab	3.26/ 1.62	5.38	.005
	Home Production	a	2.71/ 1.31		
	Agribusiness	b	2.68/ 1.33		
29-I can list three livestock grading-systems.	Land Laboratory	ab	3.44/ 1.59	8.57	.001
	Home Production	a	2.74/ 1.40		
	Agribusiness	b	2.69/ 1.35		
30-I can list and explain the functions and purposes of three local government agencies such as A.S.C., C.P.A. and F.H.A.	Land Laboratory	ab	3.23/ 1.64	4.48	.012
	Home Production	a	2.68/ 1.33		
	Agribusiness	b	2.76/ 1.97		
31-I can fill out a standard farm agreement contract correctly.	Land Laboratory		3.29/ 1.61	2.52	.082
	Home Production		2.92/ 1.35		
	Agribusiness		2.89/ 1.26		

Table C2
Continued

Competency Statement	Focus on S.O.E.P.		Mean/S.D.	F-ratio	Sign
32-I can explain the purposes of a "will".	Land Laboratory	a	3.16/ 1.30	4.31	.014
	Home Production	a	2.74/ .94		
	Agribusiness		2.95/ .98		
33-I can write a legal description of a given acreage of land or locate areas and give acreage in a plot book.	Land Laboratory	ab	3.38/ 1.59	7.75	.001
	Home Production	a	2.72/ 1.24		
	Agribusiness	b	2.75/ 1.30		
34-I can list at least ten laws affecting the employment of a minor student.	Land Laboratory		3.11/ 1.51	1.76	.173
	Home Production		2.78/ 1.45		
	Agribusiness		2.80/ 1.38		
35-I can complete the U.S. tax forms, 1040 and schedule F, using a farm record book.	Land Laboratory	b	3.17/ 1.36	4.16	.016
	Home Production		2.93/ .98		
	Agribusiness	b	2.71/ 1.01		
36-I can identify a two - and a four cycle engine.	Land Laboratory	ab	3.41/ 1.18	5.60	.004
	Home Production	a	2.95/ 1.12		
	Agribusiness	b	3.04/ .84		
37-I can disassemble, inspect, and re-assemble properly the ignition components of a battery or magneto sytem.	Land Laboratory		3.04/ 1.40	.756	.470
	Home Production		2.95/ 1.32		
	Agribusiness		2.81/ 1.06		
38-I can disassemble and display parts in an orderly manner, inspect and repair or replace worn parts and re-assemble a carburetor.	Land Laboratory		3.11/ 1.33	.561	.571
	Home Production		3.07/ 1.26		
	Agribusiness		2.93/ 1.00		

Table C2
Continued

Competency Statement	Focus on S.O.E.P.		Mean/S.D.	F-ratio	Sign
39-I can identify these parts face, margins, retainers, exhaust springs, intake spring, and value guides.	Land Laboratory Home Production Agribusiness		3.05/ 1.22 3.06/ 1.26 2.93/ .91	.295	.745
40-I can perform the daily preventive maintenance skills for an engine.	Land Laboratory Home Production Agribusiness		3.26/ 1.22 3.20/ .96 3.26/ .73	.117	.890
41-I can select arc welding and welding safety equipment that will adequately protect my eyes, skin and clothing from burns.	Land Laboratory Home Production Agribusiness	b b	3.47/ 1.13 3.26/ .98 3.11/ .88	3.12	.045
42-I can turn on, select, correct operating pressures, light and adjust the flame and turn off oxyacetylene welding and cutting equipment.	Land Laboratory Home Production Agribusiness		3.51/ 1.17 3.35/ 1.01 3.26/ .83	1.69	.186
43-I can demonstrate the safe use and maintenance procedure in using a circular saw, electric drill, and jigsaw or sabre saw.	Land Laboratory Home Production Agribusiness		3.40/ 1.09 3.21/ .96 3.31/ .76	1.09	.337

Table C2
Continued

Competency Statement	Focus on S.O.E.P.	Mean/S.D.	F-ratio	Sign
44-I can cut thread and form a stationary "tee" or 90 elbo, a union reducing from 3/4" to 1/2" and a stationary automatic water bucket or similar unit.	Land Laboratory Home Production Agribusiness	3.26/ 1.44 3.17/ 1.20 3.16/ 1.03	.184	.832
45-I can layout the corners of a 60' x 50' rectangle.	Land Laboratory Home Production Agribusiness	3.22/ 1.28 3.12/ 1.21 3.08/ 1.28	.373	.689
46-I can identify the parts of a farm tractor.	Land Laboratory Home Production Agribusiness	2.97/ 1.39 2.93/ 1.19 2.95/ .43	.039	.462
47-I can time the ignition system of a tractor.	Land Laboratory Home Production Agribusiness	2.99/ 1.47 3.12/ 1.31 2.86/ 1.07	1.25	.286
48-I can remove and explain the functions and replace the fuel tank, lines, and filters, check the system for leaks and damage, and make the necessary repairs of a tractor.	Land Laboratory Home Production Agribusiness	3.11/ 1.36 3.07/ 1.13 3.04/ .75	.077	.426
49-I can both remove explain the functions and and replace the thermostate and check the complete unit for leaks on a tractor.	Land Laboratory Home Production Agribusiness	3.28/ 1.34 3.23/ 1.23 3.08/ .88	.783	.458

Table C2
Continued

Competency Statement	Focus on S.O.E.P.		Mean/S.D.	F-ratio	Sign
50-I can identify the parts of selected farm implements based on the operator's manual.	Land Laboratory	ab	3.38/ 1.25	3.31	.038
	Home Production	a	3.09/ .98		
	Agribusiness	c	3.03/ .86		
51-I can inspect and replace worn parts of a weed sprayer.	Land Laboratory	b	3.31/ 1.36	4.37	.013
	Home Production	c	3.14/ 1.17		
	Agribusiness	bc	2.83/ .86		
52-I can adjust a trailer mounted or semi-mounted plow.	Land Laboratory		3.20/ 1.32	1.37	.254
	Home Production		2.95/ 1.10		
	Agribusiness		3.05/ .90		

*-Significant at $\alpha = .05$

APPENDIX D

FREQUENCY AND PERCENTAGE OF DIFFERENT LEVEL OF STUDENTS' PERCEIVED
COMPETENCE IN PRODUCTION AGRICULTURE (IN 52 COMPETENCIES)
BASED ON 1-THE STUDENTS' PLACE OF RESIDENCE,
AND 2-STUDENTS' TYPE OF S.O.E.P.

TABLE D1
Frequency, Percentage and Chi-Square of Relationship Between Students'
Perceived Competency Statements (The Performance Objectives
a Secondary Vocational Agriculture Instructor
May be Teaching) by Their Place of Residence.
(N = 331)

Competency Statement	Place of Residence	Frequency of Response						Chi sq.	df	Sign	
		Cannot do	Can do with help	Can do by myself	Can show others how	Have not been taught	No Response				
		N/ %	N/ %	N/ %	N/ %	N/ %	N/ %				
1-I can identify, select, and rank a group of cattle for production of breeding stock or feeders	FARM	12 6.6	84 46.2	50 27.5	18 9.9	18 9.9		182 56.0	33.25	4	.00*
	Not on FARM	10 7.0	56 39.2	23 16.1	5 3.5	49 34.3	6	143 44.0			
2-I can identify, select, and rank a group of dairy animals.	FARM	10 5.5	68 37.4	69 37.9	23 12.6	12 6.6		182 55.7	38.08	4	.00*
	Not on FARM	12 8.3	51 35.2	31 21.4	8 5.5	43 29.7	4	145 44.3			
3-I can identify, select, birds for specific production purposes.	FARM	40 22.0	47 25.8	16 8.8	3 1.6	76 41.8		182 55.7	19.72	4	.00*
	Not on FARM	26 17.9	37 25.5	24 16.6	1 .7	57 39.3	4	145 44.3			
4-I can identify, select, and rank a group of breeding sheep, for specific production purposes.	FARM	28 15.4	45 24.7	23 12.6	9 4.9	77 42.3		182 55.7	19.72	4	.00*
	Not on FARM	38 26.2	27 18.6	7 4.8	0 0	73 50.3	4	145 44.3			
5-I can identify, select, and rank a group of swine for specific production purposes.	FARM	10 5.5	75 41.2	49 26.9	16 8.8	32 17.6		182 55.7	23.32	4	.00*
	Not on FARM	18 12.4	41 28.3	28 19.3	6 4.1	52 35.9	4	145 44.3			
6-I can name the primary parts and identify functions of the re-production system of plants.	FARM	29 15.9	56 30.8	67 36.8	13 7.1	17 9.3		182 55.7	12.43	4	.01*
	Not on FARM	19 13.1	59 44.7	38 46.2	4 2.8	25 17.2	4	145 44.3			

TABLE D1

Continued

Competency Statement	Place of Residence	Frequency of Response						Chi sq.	df	Sign
		Cannot do N %	Can do with help N %	Can do by myself N %	Can show others how N %	Have not been taught N %	No Response			
7-I can determine the expected date of birth or hatching of various farm animals or birds.	FARM	<u>7</u> 3.9	<u>45</u> 24.9	<u>74</u> 40.9	<u>24</u> 13.3	<u>31</u> 17.1		<u>181</u> 55.5		
	Not on FARM	<u>32</u> 22.1	<u>30</u> 20.7	<u>21</u> 14.5	<u>12</u> 8.3	<u>50</u> 34.5	5	<u>145</u> 44.5	55.73	.00*
8-I can compare and evaluate efficiency and economics of material handling systems.	FARM	<u>10</u> 5.5	<u>58</u> 31.9	<u>61</u> 33.5	<u>8</u> 4.4	<u>45</u> 24.7		<u>182</u> 55.8		
	Not on FARM	<u>22</u> 15.3	<u>42</u> 29.2	<u>12</u> 8.3	<u>4</u> 2.8	<u>64</u> 44.4	5	<u>144</u> 44.2	40.71	.00*
9-I can perform such pertinent skills as castrating, dehorning, ringing, docking, and deheading.	FARM	<u>11</u> 6.1	<u>58</u> 33.0	<u>63</u> 34.3	<u>29</u> 16.0	<u>20</u> 11.0		<u>181</u> 55.5		
	Not on FARM	<u>12</u> 8.3	<u>47</u> 32.4	<u>29</u> 20.0	<u>9</u> 6.2	<u>48</u> 33.1	5	<u>145</u> 44.5	32.33	.00*
10-I can recognize the function of and plan the efficient use of feed additives.	FARM	<u>13</u> 7.3	<u>17</u> 39.5	<u>53</u> 29.9	<u>19</u> 10.7	<u>22</u> 12.4		<u>177</u> 55.0		
	Not on FARM	<u>20</u> 13.8	<u>50</u> 34.5	<u>27</u> 18.6	<u>7</u> 4.8	<u>41</u> 28.3	9	<u>145</u> 45.0	21.56	.00*
11-I can interpret the results of computer print out.	FARM	<u>23</u> 12.8	<u>36</u> 20.0	<u>29</u> 16.1	<u>9</u> 5.0	<u>83</u> 46.1		<u>180</u> 55.4		
	Not on FARM	<u>35</u> 24.1	<u>31</u> 21.4	<u>14</u> 9.7	<u>1</u> .7	<u>64</u> 44.1	6	<u>145</u> 44.6	13.32	.00*
12-I can identify the alternative systems for marketing farm animals.	FARM	<u>15</u> 8.3	<u>67</u> 37.0	<u>40</u> 22.1	<u>13</u> 7.2	<u>46</u> 25.4		<u>181</u> 55.5		
	Not on FARM	<u>17</u> 11.7	<u>44</u> 30.0	<u>25</u> 17.2	<u>0</u> 0	<u>59</u> 40.7	5	<u>145</u> 44.5	19.22	.00*
13-I can grade eggs.	FARM	<u>19</u> 10.5	<u>49</u> 25.4	<u>28</u> 15.5	<u>9</u> 5.0	<u>79</u> 43.6		<u>181</u> 55.5		
	Not on FARM	<u>16</u> 11.0	<u>29</u> 20.0	<u>27</u> 18.6	<u>7</u> 4.8	<u>66</u> 45.5	5	<u>145</u> 44.5	1.58	.81

TABLE D1

Continued

Competency Statement	Place of Residence	Frequency of Response						Chi sq.	df	Sign
		Cannot do	Can do with help	Can do by myself	Can show others how	Have not been taught	No Response			
		N/%	N/%	N/%	N/%	N/%	N/%			
14-I can determine when and how to market milk.	FARM	21 11.6	59 32.6	40 22.1	6 3.3	55 30.4		20.72	4	.00*
	Not on FARM	21 14.5	32 22.1	15 10.3	2 1.4	75 51.7	5			
15-I can categorize each plant and weed on a list as to whether it is a winter or spring annual.	FARM	32 17.7	82 45.3	27 14.9	7 3.9	32 17.7		13.62	4	.01*
	Not on FARM	22 15.2	49 33.8	30 20.7	1 .7	43 29.7	6			
16-I can identify plant nutrient deficiencies which affect a particular Michigan agricultural field crop.	FARM	33 19.0	68 39.1	32 18.4	11 6.3	30 17.2		11.14	4	.02*
	Not on FARM	31 41.4	55 37.9	17 11.7	2 1.4	14 27.6	12			
17-I can determine when crops are ready to be harvested.	FARM	3 1.7	27 15.0	102 56.7	48 26.7	0 0		40.69	4	.00*
	Not on FARM	2 5.0	35 24.8	65 46.1	16 11.3	18 12.8	10			
18-I can state the optimum time of planting for a particular crop.	FARM	6 3.4	58 33.4	77 43.0	33 18.4	5 2.8		49.85	4	.00*
	Not on FARM	16 11.2	44 30.8	45 31.5	6 4.2	32 22.4	9			
19-I can recommend the crop and variety for a farm in any home country.	FARM	12 6.7	48 26.8	92 51.4	18 10.1	9 5.0		49.93	4	.00*
	Not on FARM	23 15.9	26 31.7	31 21.4	9 6.2	36 24.8	7			

TABLE D1

Continued

Competency Statement	Place of Residence	Frequency of Response						Chi sq.	df	Sign	
		Cannot do	Can do with help	Can do by myself	Can show others how	Have not been taught	No Response				
		N/ %	N/ %	N/ %	N/ %	N/ %					
20-I can choose the three most nearly ideal seed bed situations for a given crop.	FARM	<u>15</u> 8.4	<u>66</u> 36.9	<u>67</u> 37.4	<u>15</u> 8.4	<u>16</u> 8.9		<u>179</u> 55.2	53.47	4	.00*
		<u>24</u> 16.6	<u>49</u> 33.8	<u>15</u> 10.3	<u>8</u> 5.5	<u>49</u> 33.8	7	<u>145</u> 44.8			
21-I can determine optimum row width seeding rate, depth of seed, fertilizer placement, and proper seed treatment for each crop grown in my home country.	FARM	<u>17</u> 9.5	<u>91</u> 50.8	<u>50</u> 27.9	<u>10</u> 5.6	<u>11</u> 6.1		<u>179</u> 55.4	24.81	4	.00*
	Not on FARM	<u>27</u> 18.8	<u>58</u> 44.3	<u>27</u> 18.8	<u>3</u> 2.1	<u>29</u> 20.1	8	<u>144</u> 44.6			
22-I can recommend proper amounts of chemical weed control for a specific weed.	FARM	<u>27</u> 15.1	<u>77</u> 43.0	<u>41</u> 22.9	<u>10</u> 5.6	<u>24</u> 13.4		<u>179</u> 55.6	20.64	4	.00*
	Not on FARM	<u>26</u> 18.2	<u>47</u> 32.9	<u>21</u> 14.7	<u>3</u> 2.1	<u>46</u> 32.2	9	<u>143</u> 44.4			
23-I can identify several common forms of seeds and plants.	FARM	<u>4</u> 2.2	<u>39</u> 21.8	<u>97</u> 54.2	<u>27</u> 15.1	<u>12</u> 6.7		<u>179</u> 55.2	22.13	4	.00*
	Not on FARM	<u>11</u> 7.6	<u>54</u> 37.2	<u>51</u> 35.2	<u>13</u> 9.0	<u>16</u> 11.0	7	<u>145</u> 44.8			
24-I can identify insect problems, tell if control is necessary, and make a recommendation for controlling each problem.	FARM	<u>24</u> 7.8	<u>88</u> 49.2	<u>50</u> 27.9	<u>8</u> 4.5	<u>19</u> 10.6		<u>179</u> 55.4	23.01	4	.00*
	Not on FARM	<u>3</u> 16.0	<u>57</u> 39.6	<u>25</u> 17.4	<u>2</u> 1.4	<u>37</u> 25.7	8	<u>144</u> 44.6			

Table D1

Continued

Competency Statement	Place of Residence	Frequency of Response						Chi sq. df Sign
		Cannot do N/1	Can do with help N/1	Can do by myself N/1	Can show others how N/1	Have not been taught N/1	No Response N/1	
25-I can determine the the quality of each analysis of fertilizer needed to most nearly meet recommended fertilizer requirements per acre for each crop in my home county.	FARM	<u>25</u> 14.0	<u>82</u> 46.1	<u>41</u> 23.0	<u>11</u> 6.2	<u>19</u> 10.7		27.28 4 .00*
	Not on FARM	<u>28</u> 19.4	<u>46</u> 31.9	<u>21</u> 14.6	<u>4</u> 2.8	<u>45</u> 31.3	9	
26-I can balance a farm account.	FARM	<u>6</u> 3.3	<u>56</u> 31.1	<u>80</u> 41.4	<u>24</u> 13.3	<u>14</u> 7.8		34.60 4 .00*
	Not on FARM	<u>17</u> 11.8	<u>54</u> 37.5	<u>31</u> 21.5	<u>11</u> 7.6	<u>31</u> 21.5	7	
27-I can secure a farm loan and make regular payments on interest and principal.	FARM	<u>30</u> 16.7	<u>60</u> 33.3	<u>51</u> 28.3	<u>21</u> 11.7	<u>18</u> 10.0		43.14 4 .00*
	Not on FARM	<u>25</u> 17.4	<u>35</u> 24.3	<u>31</u> 21.5	<u>1</u> .7	<u>52</u> 36.1	7	
28-I can list the five steps in producing and marketing a commodity.	FARM	<u>32</u> 18.2	<u>60</u> 34.1	<u>47</u> 26.7	<u>5</u> 2.8	<u>32</u> 11.2		18.33 4 .00*
	Not on FARM	<u>23</u> 15.9	<u>48</u> 32.1	<u>19</u> 13.1	<u>2</u> 1.4	<u>53</u> 36.6	10	
29-I can list three livestock grading-systems.	FARM	<u>33</u> 18.5	<u>61</u> 34.3	<u>38</u> 21.3	<u>8</u> 4.5	<u>38</u> 21.3		9.24 4 .05*
	Not on FARM	<u>28</u> 19.3	<u>34</u> 23.4	<u>26</u> 17.9	<u>9</u> 4.1	<u>51</u> 35.2	8	
30-I can list and explain the functions and purposes of three local government agencies such as A.S.C., C.P.A. and F.H.A.	FARM	<u>29</u> 16.1	<u>61</u> 33.9	<u>53</u> 29.4	<u>4</u> 2.2	<u>33</u> 18.3		24.61 4 .00*
	Not on Farm	<u>33</u> 23.2	<u>31</u> 21.8	<u>23</u> 16.2	<u>1</u> .7	<u>54</u> 38.0	9	

Table D1

Continued

Competency Statement	Place of Residence	Frequency of Response						Chi sq. df Sign
		Cannot do N/%	Can do with help N/%	Can do by myself N/%	Can show others how N/%	Have not been taught N/%	No Response N/%	
31-I can fill out a standard farm agreement contract correctly.	FARM	17 9.5	61 34.1	54 30.2	9 5.0	38 21.2		25.26 4 .00*
	Not on FARM	23 16.1	45 31.5	16 11.2	4 2.8	55 38.5	9	
32-I can explain the purposes of a "will".	FARM	8 4.5	62 34.8	81 45.5	13 7.3	14 7.9		18.99 4 .00*
	Not on FARM	12 8.5	34 23.9	55 38.7	8 5.6	33 23.2	11	
33-I can write a legal description of a given acreage of land or locate areas and give acreage in a plot book.	FARM	23 12.8	60 33.5	57 31.8	16 8.9	23 12.8		43.61 4 .00*
	Not on FARM	29 20.3	31 21.7	22 15.4	4 2.8	57 39.9	9	
34-I can list at least ten laws affecting the employment of a minor student.	FARM	34 19.0	53 29.6	38 21.2	13 7.3	41 22.9		9.47 4 .05*
	Not on FARM	27 18.9	41 28.7	31 21.7	1 .7	43 30.1	9	
35-I can complete the U.S. tax forms, 1040 and schedule F, using a farm record book.	FARM	14 7.8	44 24.6	75 21.9	33 18.4	13 7.3		22.80 4 .00*
	Not on FARM	16 11.2	45 31.5	42 29.4	11 7.7	29 20.3	9	

Table D1

Continued

Competency Statement	Place of Residence	Frequency of Response						Chi sq. df Sign		
		Cannot do	Can do with help	Can do by myself	Can show others how	Have not been taught	No Response			
		N %	N %	N %	N %	N %				
36-I can identify a two - and a four cycle engine.	FARM	<u>14</u> 7.8	<u>41</u> 22.8	<u>66</u> 36.7	<u>42</u> 23.3	<u>17</u> 9.4		<u>180</u> 55.7	0.17	4 .018
	Not on FARM	<u>10</u> 7.1	<u>21</u> 14.7	<u>61</u> 42.7	<u>29</u> 20.3	<u>22</u> 15.4	8	<u>143</u> 44.3		
37-I can disassemble, inspect, and re-assemble properly the ignition components of a battery or magneto system.	FARM	<u>18</u> 10.2	<u>58</u> 32.8	<u>48</u> 27.1	<u>21</u> 11.9	<u>32</u> 18.1		<u>177</u> 55.7	4.13	4 .38 *
	Not on FARM	<u>14</u> 9.9	<u>55</u> 39.1	<u>31</u> 22.0	<u>10</u> 7.1	<u>31</u> 22.0	13	<u>141</u> 44.3		
38-I can disassemble and display parts in an orderly manner, inspect and repair or replace worn parts and re-assemble a carburetor.	FARM	<u>16</u> 9.0	<u>50</u> 28.2	<u>58</u> 32.8	<u>22</u> 12.4	<u>31</u> 17.5		<u>177</u> 55.5	3.38	4 .49
	Not on FARM	<u>13</u> 9.2	<u>31</u> 21.8	<u>56</u> 39.4	<u>13</u> 9.2	<u>29</u> 20.4	12	<u>142</u> 44.5		
39-I can identify these parts face, margins, retainers, exhaust springs, intake spring, and valve guides.	FARM	<u>10</u> 5.6	<u>52</u> 29.4	<u>58</u> 32.8	<u>29</u> 16.4	<u>28</u> 15.8		<u>177</u> 55.5	8.27	4 .08
	Not on FARM	<u>14</u> 9.9	<u>37</u> 26.1	<u>58</u> 40.8	<u>11</u> 7.7	<u>22</u> 15.5	12	<u>142</u> 44.5		
40-I can perform the daily preventive maintenance skills for an engine.	FARM	<u>6</u> 3.4	<u>22</u> 12.3	<u>99</u> 55.3	<u>33</u> 18.4	<u>19</u> 10.6		<u>179</u> 55.6	7.09	4 .13
	Not on FARM	<u>9</u> 6.3	<u>21</u> 14.7	<u>60</u> 42.0	<u>29</u> 20.3	<u>24</u> 16.8	9	<u>143</u> 44.4		

TABLE D1

Continued

Competency Statement	Place of Residence	Frequency of Response						Chi sq.	df	Sign
		Cannot do	Can do with help	Can do by myself	Can show others how	Have not been taught	No Response			
		N/%	N/%	N/%	N/%	N/%		Total		
								N/%		
41-I can select arc welding and welding safety equipment that will adequately protect my eyes, skin and clothing from burns.	FARM	$\frac{5}{2.8}$	$\frac{33}{18.4}$	$\frac{58}{47.5}$	$\frac{36}{20.1}$	$\frac{20}{11.2}$		$\frac{179}{55.6}$	8.47	4 .07
	Not on FARM	$\frac{7}{4.9}$	$\frac{16}{4.2}$	$\frac{59}{41.3}$	$\frac{33}{23.1}$	$\frac{28}{19.6}$	9	$\frac{143}{44.4}$		
42-I can turn on, select, correct operating pressures, light and adjust the flame and turn off oxyacetylene welding and cutting equipment.	FARM	$\frac{4}{2.2}$	$\frac{32}{17.9}$	$\frac{17}{33.6}$	$\frac{43}{24.0}$	$\frac{22}{12.6}$		$\frac{179}{55.6}$	9.36	4 .05*
	Not on FARM	$\frac{7}{4.2}$	$\frac{15}{10.5}$	$\frac{53}{37.1}$	$\frac{38}{26.6}$	$\frac{30}{21.0}$	9	$\frac{143}{44.4}$		
43-I can demonstrate the safe use and maintenance procedure in using a circular saw, electric drill, and jigsaw or sabre saw.	FARM	$\frac{5}{2.8}$	$\frac{25}{14.0}$	$\frac{19}{50.3}$	$\frac{41}{22.9}$	$\frac{18}{10.1}$		$\frac{179}{55.6}$	2.39	4 .49
	Not on FARM	$\frac{5}{3.5}$	$\frac{18}{12.6}$	$\frac{62}{43.4}$	$\frac{35}{24.5}$	$\frac{23}{16.1}$	9	$\frac{143}{44.4}$		
44-I can cut thread and form a stationary "tee" or 90 elbo, a union reducing from 3/4" to 1/2" and a stationary automatic water bucket or similar unit.	FARM	$\frac{10}{5.6}$	$\frac{42}{23.6}$	$\frac{66}{57.1}$	$\frac{26}{14.6}$	$\frac{34}{19.1}$		$\frac{178}{55.8}$	8.65	4 .07
	Not on FARM	$\frac{12}{8.5}$	$\frac{36}{25.5}$	$\frac{40}{28.4}$	$\frac{12}{8.5}$	$\frac{41}{29.1}$	12	$\frac{141}{44.2}$		

TABLE D1

Continued

Competency Statement	Place of Residence	Frequency of Response						Chi sq.	df	Sign
		Cannot do	Can do with help	Can do by myself	Can show others how	Have not been taught	No Response			
		N/ %	N/ %	N/ %	N/ %	N/ %				
45-I can layout the corners of a 60' x 50' rectangle.	FARM	<u>8</u> 4.5	<u>51</u> 29.0	<u>64</u> 36.4	<u>20</u> 11.4	<u>33</u> 18.8		<u>176</u> 55.2		
	Not on FARM	<u>10</u> 7.0	<u>41</u> 28.7	<u>45</u> 31.5	<u>9</u> 6.3	<u>38</u> 26.6	12	<u>143</u> 44.8	5.79	4 .21
46-I can identify the parts of a farm tractor.	FARM	<u>12</u> 6.7	<u>56</u> 31.5	<u>66</u> 37.1	<u>20</u> 11.2	<u>24</u> 13.5		<u>178</u> 55.5		
	Not on FARM	<u>13</u> 9.1	<u>49</u> 34.3	<u>42</u> 29.4	<u>8</u> 5.6	<u>31</u> 21.7	10	<u>143</u> 44.5	18.15	4 .08
47-I can time the ignition system of a tractor.	FARM	<u>14</u> 7.9	<u>58</u> 32.6	<u>53</u> 29.8	<u>14</u> 7.9	<u>39</u> 21.9		<u>178</u> 55.5		
	Not on FARM	<u>16</u> 11.2	<u>53</u> 37.1	<u>32</u> 22.4	<u>8</u> 5.6	<u>34</u> 22.8	10	<u>143</u> 45.5	3.75	4 .44
48-I can remove and replace the fuel tank, lines and filters, check the system for leaks and damage, and make the necessary repairs of a tractor.	FARM	<u>11</u> 6.1	<u>43</u> 24.0	<u>77</u> 23.0	<u>24</u> 13.4	<u>24</u> 13.4		<u>179</u> 55.26		
	Not on FARM	<u>8</u> 5.6	<u>39</u> 27.3	<u>54</u> 37.8	<u>13</u> 9.1	<u>29</u> 20.3	9	<u>143</u> 44.4	4.48	4 .34
49-I can both remove explain the functions and and replace the thermostate and check the complete unit for leaks on a tractor.	FARM	<u>9</u> 5.0	<u>44</u> 24.6	<u>68</u> 38.0	<u>23</u> 12.8	<u>35</u> 19.6		<u>179</u> 15.6		
	Not on FARM	<u>8</u> 5.6	<u>34</u> 23.8	<u>55</u> 38.5	<u>10</u> 7.0	<u>36</u> 25.2	9	<u>143</u> 44.4	3.87	4 .42

TABLE D1

Continued

Competency Statement	Place of Residence	Frequency of Response						Chi sq.	df	Sign	
		Cannot do	Can do with help	Can do by myself	Can show others how	Have not been taught	No response				
		N/ %	N/ %	N/ %	N/ %	N/ %	N/ %				
50-I can identify the parts of selected farm implements based on the operator's manual.	FARM	<u>8</u> 4.5	<u>30</u> 16.8	<u>97</u> 54.2	<u>24</u> 13.2	<u>20</u> 11.2		<u>179</u> 55.6	10.95	4	.02*
	Not on FARM	<u>7</u> 4.9	<u>31</u> 21.7	<u>57</u> 39.9	<u>16</u> 11.2	<u>32</u> 22.4	9	<u>143</u> 44.4			
51-I can inspect and replace worn parts of a weed sprayer.	FARM	<u>8</u> 4.5	<u>47</u> 26.3	<u>78</u> 43.6	<u>20</u> 11.2	<u>26</u> 14.5		<u>179</u> 55.6	15.9	4	.00*
	Not on FARM	<u>8</u> 5.6	<u>47</u> 32.9	<u>39</u> 27.3	<u>10</u> 7.0	<u>39</u> 27.3	9	<u>143</u> 44.4			
52-I can adjust a trailer mounted or semi-mounted plow.	FARM	<u>9</u> 5.0	<u>46</u> 25.7	<u>80</u> 44.7	<u>24</u> 13.4	<u>20</u> 11.2		<u>179</u> 55.6	14.80	4	.00*
	Not on FARM	<u>9</u> 6.3	<u>41</u> 28.7	<u>49</u> 34.3	<u>9</u> 6.3	<u>35</u> 24.5	9	<u>143</u> 34.4			

*Significant at $\alpha = .05$

TABLE D2
Frequency, Percentage, and Chi-square of Relationship Between Students'
Perceived Competency Statements (The Performance Objectives a
Secondary Vocational Agriculture Instructor May be
Teaching) By Their Type of S.O.E.P.
(N=331)

Competency Statement	Focus on S.O.E.P.	Frequency of Response						Chi sq. df Sign
		Cannot do	Can do with help	Can do by myself	Can show others how	Have not been taught	No response	
		N/%	N/%	N/%	N/%	N/%	N/%	
1-I can identify, select, and rank a group of cattle for production of breeding stock or or feeders	Land Laboratory	8 7.4	41 38.0	12 11.1	4 3.7	43 29.8	108 33.2	47.14 8 .000*
	Home Production	9 7.1	57 45.2	33 26.2	15 11.9	12 7.5	126 38.8	
	Agribusiness	5 5.5	42 46.2	28 30.8	4 4.4	12 13.2	91 28.0	
2-I can identify, select, and rank a group of dairy animals.	Land Laboratory	3 7.4	36 33.3	17 15.7	6 5.6	41 38.0	108 33.0	63.38 8 .000*
	Home Production	7 5.6	55 43.7	47 37.3	11 8.7	6 4.8	126 38.5	
	Agribusiness	7 7.5	28 30.1	36 38.7	14 15.1	8 8.6	93 28.4	
3-I can identify, select, and rank a group of birds for specific production purposes.	Land Laboratory	18 16.7	22 20.4	15 13.9	0 0	53 49.1	108 320	25.88 8 .001*
	Home Production	35 27.8	34 27.0	7 5.6	4 3.2	46 36.5	126 38.5	
	Agribusiness	13 14.0	28 30.1	18 19.4	0 0	34 36.6	93 28.4	
4-I can identify, select, and rank a group of breeding sheep, for specific production purposes.	Land Laboratory	22 20.4	17 15.7	2 1.9	0 0	67 62.0	108 33.0	36.70 8 .000*
	Home Production	26 20.6	39 31.0	16 12.7	7 5.6	38 30.2	126 38.5	
	Agribusiness	18 19.4	16 17.2	12 12.9	2 2.2	45 48.4	93 28.4	
5-I can identify, select, and rank a group of swine for specific production purposes.	Land Laboratory	11 10.2	32 29.6	15 13.9	2 1.9	48 44.4	108 33.0	44.44 8 .000*
	Home Production	9 7.1	57 45.2	36 28.6	9 7.1	15 11.9	126 38.5	
	Agribusiness	8 8.6	27 29.0	26 28.0	11 11.8	21 22.6	93 28.4	

Table D2

Continued

Competency Statement	Focus on S.O.E.P.	Frequency of Response					No Response	Total	Chi sq.	df	Sign
		Cannot do	Can do with help	Can do by myself	Can show others how	Have not been taught					
		N/%	N/%	N/%	N/%	N/%		N/%			
6-I can name the primary parts and identify functions of the reproduction system of plants.	Land Laboratory	10 9.3	42 38.9	35 32.4	2 1.9	19 17.6		108 33.0	20.16	8	.009*
	Home Production	25 19.8	40 33.7	44 34.9	4 3.2	13 10.3		126 38.5			
	Agribusiness	13 14.0	33 35.5	26 28.0	11 11.8	10 10.8	4	93 28.5			
7-I can determine the expected date of birth or hatching of various farm animals or birds.	Land Laboratory	22 20.4	24 22.2	10 9.3	4 3.7	48 44.4		108 33.1	73.30	8	.000*
	Home Production	9 7.2	31 24.8	54 43.2	12 9.6	19 15.2		125 38.3			
	Agribusiness	8 8.6	20 21.5	31 33.3	20 21.5	14 15.1	5	93 28.5			
8-I can compare and evaluate efficiency and economics of material handling systems.	Land Laboratory	16 14.8	35 32.4	10 9.3	1 .9	46 42.6		108 33.1	28.11	8	.000*
	Home Production	8 6.3	34 27.0	42 33.3	7 5.6	35 27.6		126 38.6			
	Agribusiness	8 8.7	31 33.7	21 22.8	4 4.3	28 30.4	5	92 28.2			
9-I can perform such pertinent skills as castrating, dehorning, ringing, docking, and deheading.	Land Laboratory	9 8.3	37 34.3	13 12.0	4 3.7	45 41.7		108 33.1	58.57	8	.000*
	Home Production	8 6.4	41 32.8	45 36.0	20 16.0	11 8.8		125 38.3			
	Agribusiness	6 6.5	27 29.0	34 36.6	14 15.1	12 12.9	5	93 28.5			
10-I can recognize the function of and plan the efficient use of feed additives.	Land Laboratory	16 14.8	28 25.9	22 20.4	4 3.7	38 35.2		108 33.5	34.75	8	.000*
	Home Production	10 8.1	52 42.3	33 26.8	12 9.8	16 13.0		123 38.2			
	Agribusiness	7 7.7	40 44.0	25 27.5	10 11.0	9 9.9	9	91 28.3			

Table D2

Continued

Competency Statement	Focus on S.O.E.P.	Frequency of Response						Chi sq. df Sign			
		Cannot do	Can do with help	Can do by myself	Can show others how	Have not been taught	No Response				
		N %	N %	N %	N %	N %	N %				
11-I can interpret the results of computer print out.	Land Laboratory	22 20.4	18 16.7	15 13.9	2 1.9	51 47.2		108 33.2	7.06	8	.529
	Home Production	20 16.1	23 18.5	16 12.9	6 4.8	59 48.6		124 38.2			
	Agribusiness	16 17.2	26 28.0	12 12.9	2 2.2	37 39.8	6	93 28.6			
12-I can identify alternative systems for marketing farm animals.	Land Laboratory	9 8.3	29 26.9	17 15.7	0 0	53 49.1		108 33.1	27.89	8	.000*
	Home Production	13 10.4	46 36.8	24 19.2	9 7.2	33 26.4		125 38.3			
	Agribusiness	10 10.8	36 38.7	24 25.8	4 4.3	19 20.4	5	93 28.5			
13-I can grade eggs.	Land Laboratory	11 10.2	20 10.5	19 17.6	3 2.8	55 50.9		108 33.1	14.68	8	.065
	Home Production	16 12.8	30 24.0	19 15.2	3 2.4	57 45.6		125 38.3			
	Agribusiness	8 8.6	25 26.9	17 13.3	10 10.8	33 35.5	5	93 28.5			
14-I can determine when and how to market milk.	Land Laboratory	14 13.0	23 21.3	10 9.3	0 0	61 56.5		108 33.1	27.67	8	.000*
	Home Production	17 13.6	36 28.8	31 24.8	5 4.0	36 28.8		125 38.3			
	Agribusiness	11 11.8	32 34.4	14 15.1	3 3.2	33 35.5	5	93 28.5			
15-I can categorize each plant and weed on a list as to whether it is a winter or spring annual.	Land Laboratory	20 18.5	32 29.6	22 20.2	1 .9	33 30.6		108 33.1	15.67	8	.109
	Home Production	23 18.4	53 42.4	20 16.0	3 2.4	25 20.0		125 38.3			
	Agribusiness	11 11.8	46 49.5	15 16.1	4 4.3	17 18.3	5	93 28.5			

Table D2

Continued

Competency Statement	Focus on S.O.E.P.	Frequency of Response						Chi sq. df Sign		
		Cannot do	Can do with help	Can do by myself	Can show others how	Have not been taught	No Response			
		N	N	N	N	N	N			
16-I can identify plant nutrient deficiencies which affect a particular Michigan agricultural field crop.	Land Laboratory	19	36	16	2	34		107	14.38	8 .072
		17.8	33.6	15.0	1.9	31.8		33.5		
	Home Production	28	53	16	5	17		119		
17-I can determine when crops are ready to be harvested.		23.5	48.5	13.4	4.2	14.3		37.3	37.85	8 .000*
	Agribusiness	17	34	17	6	19	12	93		
		18.3	36.6	18.3	6.5	20.4		29.2		
18-I can state the optimum time of planting for a particular crop.	Land Laboratory	6	23	42	13	16		104	42.85	8 .000*
		5.8	22.1	24.2	12.2	15.4		32.4		
	Home Production	2	23	73	27	0		125		
19-I can recommend the crop and variety for a farm in any home country.		1.6	18.4	58.4	21.6	0		38.9	50.83	8 .000*
	Agribusiness	2	16	48	24	2	10	92		
		2.2	17.4	52.2	26.1	2.2		28.7		
20-I can choose the three most nearly ideal seed bed situations for a given crop.	Land Laboratory	12	34	28	5	25		108	37.29	8 .000*
		11.4	32.4	27.6	4.8	23.8		32.6		
	Home Production	7	47	46	77	5		124		
		5.6	35.5	37.1	17.7	4.0		38.5	7	
	Agribusiness	3	24	47	12	7	9	93		
		3.2	25.8	50.5	12.9	7.5		28.9		
	Land Laboratory	15	29	24	6	33		107	50.83	8 .000*
		14.0	27.1	22.4	5.6	30.8		33.0		
	Home Production	13	32	63	11	6		125		
		10.4	25.6	50.4	8.8	4.8		38.6	7	
	Agribusiness	7	33	36	10	6	7	92		
		7.6	35.9	39.1	10.9	6.5		28.4		
	Land Laboratory	13	36	14	5	39		107	37.29	8 .000*
		12.1	33.6	13.1	4.7	36.4		33.0		
	Home Production	15	51	37	12	10		125		
		12.0	40.8	29.6	9.6	8.0		38.6	7	
	Agribusiness	11	28	31	6	16	7	92		
		12.0	13.4	33.7	6.5	17.4		28.4		

Table D2

Continued

Competency Statement	Focus on S.O.E.P.	Frequency of Response						Chi sq. df Sign
		Cannot do	Can do with help	Can do by myself	Can show others how	Have not been taught	No Response	
		N %	N %	N %	N %	N %	N %	
21-I can determine optimum row width seeding rate, depth of seed, fertilizer placement, and proper seed treatment for each crop grown in my home country.	Land Laboratory	21 19.6	47 43.9	18 16.8	1 .9	20 18.7		17.42 8 .026*
	Home Production	14 11.3	58 46.8	33 26.6	8 6.5	11 8.9		
	Agribusiness	9 9.8	44 47.8	26 28.3	4 4.3	9 9.8	8	
22-I can recommend proper amounts of chemical weed control for a specific weed.	Land Laboratory	14 13.2	40 37.7	19 17.9	2 1.9	31 29.2		17.22 8 .027*
	Home Production	13 24.0	46 36.8	23 18.4	8 6.4	18 14.4		
	Agribusiness	9 9.9	38 41.8	20 22.0	30 3.3	21 23.1	9	
23-I can identify several common forms of seeds and plants.	Land Laboratory	8 7.5	36 33.6	39 36.4	8 7.5	16 15.0		31.05 8 .000*
	Home Production	0 0	26 20.8	71 56.6	19 15.2	9 7.2		
	Agribusiness	7 7.6	31 33.7	38 41.3	13 14.1	3 3.3	7	
24-I can identify insect problems, tell if control is necessary, and make a recommendation for controlling each problem.	Land Laboratory	20 18.7	41 38.3	20 18.7	0 0	26 24.3		22.61 8 .003*
	Home Production	10 8.1	63 50.8	33 26.6	5 4.0	13 10.5		
	Agribusiness	7 7.6	41 44.6	22 23.9	5 5.4	17 18.5	8	
25-I can determine the the quality of each analysis of fertilizer needed to most nearly meet recommended fertilizer requirements per acre for each crop in my home county.	Land Laboratory	17 16.0	37 34.9	18 17.0	2 1.9	32 30.2		17.17 8 .028*
	Home Production	22 17.9	58 47.2	21 17.1	7 5.7	15 12.2		
	Agribusiness	14 15.1	33 35.5	23 24.7	6 6.5	17 18.3	9	

Table D2

Continued

Competency Statement	Focus on S.O.E.P.	Frequency of Response						Chi sq. df Sign
		Cannot do N/ %	Can do with help N/ %	Can do by myself N/ %	Can show others how N/ %	Have not been taught N/ %	No Response N/ %	
26-I can balance a farm account.	Land Laboratory	11 10.4	30 28.3	29 27.4	9 8.5	27 25.5		
	Home Production	5 4.0	47 37.6	50 40.0	12 9.6	11 8.8		25.07 8 .001*
	Agribusiness	7 7.5	33 35.5	32 34.4	14 15.1	7 7.5	7 28.7	
27-I can secure a farm loan and make regular payments on interest and principal.	Land Laboratory	13 12.3	26 24.5	23 21.7	1 .9	43 40.6		
	Home Production	24 19.2	45 36.0	31 24.8	12 9.6	13 10.4		41.27 8 .000*
	Agribusiness	18 19.4	24 25.8	28 30.1	9 9.7	14 15.1	7 28.7	
28-I can list the five steps in producing and marketing a commodity.	Land Laboratory	18 16.8	31 29.0	13 12.1	0 0	45 42.1		
	Home Production	20 16.5	43 35.5	32 26.4	3 2.5	23 19.0		26.08 8 .001*
	Agribusiness	17 18.3	34 36.6	21 22.6	4 4.3	17 18.3	10 29.0	
29-I can list three livestock grading-systems.	Land Laboratory	18 16.8	22 20.6	17 15.9	4 3.7	46 43.0		
	Home Production	24 19.5	43 35.0	26 21.1	3 2.4	47 22.0		23.64 8 .002*
	Agribusiness	19 20.4	13 32.3	21 22.6	7 7.5	16 17.2	8 28.8	
30-I can list and explain the functions and purposes of three local government agencies such as A.S.C., C.P.A. and F.H.A.	Land Laboratory	21 20.0	24 22.9	15 14.3	1 1.0	44 41.9		
	Home Production	26 21.0	39 31.5	32 25.8	1 .8	26 21.0		24.13 8 .002*
	Agribusiness	15 16.1	29 31.2	29 31.2	3 3.2	17 18.3	8 28.9	

Table D2

Continued

Competency Statement	Focus on S.O.E.P.	Frequency of Response						Chi sq. df Sign		
		Cannot do	Can do with help	Can do by myself	Can show others how	Have not been taught	No Response			
		N %	N %	N %	N %	N %				
31-I can fill out a standard farm agreement contract correctly.	Land Laboratory	16 15.2	31 29.5	10 9.5	3 2.9	45 42.9		105 32.6	34.35	8 .000*
	Home Production	12 9.7	15 14.3	28 22.6	3 2.4	31 25.0		124 38.5		
	Agribusiness	12 12.9	25 26.9	32 34.4	7 7.5	17 18.3	9	93 28.9		
	Land Laboratory	10 9.5	23 21.9	40 38.1	4 3.8	28 26.7		105 32.8		
	Home Production	6 4.9	48 39.0	51 49.5	9 7.3	9 7.3		123 38.4		
	Agribusiness	4 4.3	25 27.2	45 48.9	8 8.7	10 10.9	11	92 28.8		
33-I can write a legal description of a given acreage of land or locate areas and give acreage in a plot book.	Land Laboratory	17 16.2	22 21.0	16 15.2	4 3.8	46 43.8		105 32.6	33.44	8 .000*
	Home Production	19 15.3	42 33.9	35 28.2	10 8.1	18 14.5		124 38.5		
	Agribusiness	16 17.2	27 29.0	28 30.1	6 6.5	16 17.2	9	93 28.9		
	Land Laboratory	16 15.2	30 28.6	21 20.0	2 1.9	36 34.3		105 32.6		
	Home Production	27 21.8	39 31.5	24 19.4	5 4.0	29 23.4		124 38.5		
	Agribusiness	18 19.4	25 26.9	24 25.8	7 7.5	19 20.4	9	93 28.9		
35-I can complete the U.S. tax forms, 1040 and schedule F, using a farm record book.	Land Laboratory	9 8.6	31 29.5	29 27.6	5 4.8	31 29.5		105 32.6	48.31	8 .001*
	Home production	9 7.3	31 25.0	54 43.5	22 17.7	8 6.5		124 38.5		
	Agribusiness	12 12.9	27 29.0	34 36.6	17 18.3	3 3.2	9	93 28.9		

Table D2

Continued

Competency Statement	Focus on S.O.E.P.	Frequency of Response						Chi sq. df Sign
		Cannot do N/%	Can do with help N/%	Can do by myself N/%	Can show others how N/%	Have not been taught N/%	No response N/%	
36-I can identify a two - and a four cycle engine.	Land Laboratory	6 5.7	16 15.2	38 36.2	19 18.1	26 24.8		33.98 8 .000*
	Home Production	13 10.4	13 24.0	44 55.2	26 20.8	12 9.6		
	Agribusiness	5 5.4	16 17.2	47 48.4	26 28.0	1 1.1	8 28.8	
37-I can disassemble, inspect, and re-assemble properly the ignition components of a battery or magneto sytem.	Land Laboratory	9 8.6	43 41.0	18 17.1	5 4.8	30 28.6		25.21 8 .001*
	Home Production	15 12.3	39 32.0	31 25.4	11 9.0	26 21.3		
	Agribusiness	8 8.8	31 34.1	30 33.1	15 16.5	7 7.7	13 28.6	
38-I can disassemble and display parts in an orderly manner, inspect and repair or replace worn parts and re-assemble a carburetor.	Land Laboratory	9 8.6	32 30.5	30 28.5	6 5.7	28 26.7		24.88 8 .001*
	Home Production	12 9.8	30 24.6	42 34.4	12 9.8	26 21.3		
	Agribusiness	8 8.7	19 20.7	42 45.7	17 18.5	6 6.5	12 28.8	
39-I can identify these parts face, margins, retainers, exhaust springs, intake spring, and valve guides.	Land Laboratory	8 7.6	30 28.6	37 35.2	9 8.6	21 20.0		23.47 8 .002*
	Home Production	10 8.2	39 32.0	33 27.0	15 12.3	25 12.5		
	Agribusiness	6 6.5	20 21.7	46 50.0	16 17.4	4 4.3	12 38.8	
40-I can perform the daily preventive maintenance skills for an engine.	Land Laboratory	9 8.6	18 17.1	38 36.2	17 16.2	23 21.1		31.62 8 .000*
	Home Production	4 3.2	19 15.3	65 52.4	20 16.1	16 12.9		
	Agribusiness	2 2.2	6 6.5	56 60.2	25 26.9	4 4.3	9 28.9	

TABLE D2

Continued

Competency Statement	Focus on S.O.E.P.	Frequency of Response						Chi sq. df Sign
		Cannot do	Can do with help	Can do by myself	Can show others how	Have not been taught	No Response	
		N %	N %	N %	N %	N %	N %	
41-I can select arc welding and welding safety equipment that will adequately protect my eyes, skin and clothing from burns.	Land Laboratory	4 3.8	15 14.3	41 39.0	18 17.1	27 25.7		105 32.6
	Home Production	2 1.6	24 19.4	57 46.0	23 18.5	18 14.5		124 38.5
	Agribusiness	6 6.5	10 10.8	46 49.5	28 30.1	3 3.2	9	93 28.9
42-I can turn on, select, correct operating pressures, light and adjust the flame and turn off oxyacetylene welding and cutting equipment.	Land Laboratory	6 5.7	14 13.3	33 31.4	26 24.8	26 24.8		105 32.6
	Home Production	1 .8	25 20.2	57 41.1	23 20.2	22 17.2		124 38.5
	Agribusiness	4 4.3	8 8.6	47 50.5	30 32.3	4 4.3	9	93 28.9
43-I can demonstrate the safe use and maintenance procedure in using a circular saw, electric drill, and jigsaw or sabre saw.	Land Laboratory	5 4.8	14 13.3	40 38.1	25 23.8	21 20.0		105 32.6
	Home Production	3 2.4	23 18.5	40 48.4	23 18.5	15 12.1		124 35.5
	Agribusiness	2 2.2	6 6.5	52 55.9	23 30.1	5 5.4	9	93 28.9
44-I can cut thread and form a stationary "tee" or 90 elbo, a union reducing from 3/4" to 1/2" and a stationary automatic water bucket or similar unit.	Land Laboratory	11 10.6	29 27.9	21 20.2	8 7.7	35 33.7		104 32.6
	Home Production	7 5.6	30 24.2	48 38.7	10 8.1	29 22.4		124 38.9
	Agribusiness	4 4.4	19 20.9	37 40.7	20 22.0	11 12.1	12	91 28.5

TABLE D2

Continued

Competency Statement	Focus on S.O.E.P.	Frequency of Response						Total N %	Chi sq. df Sign		
		Cannot do	Can do with help	Can do by myself	Can show others how	Have not been taught	No Response				
		N %	N %	N %	N %	N %					
45-I can layout the corners of a 60' x 50' rectangle.	Land Laboratory	6 5.7	30 28.6	34 32.4	6 5.7	29 27.6		105 32.9	6.20	8	.624
	Home Production	8 6.6	33 27.3	43 35.5	11 9.1	26 21.5		121 37.9			
	Agribusiness	4 4.3	29 31.2	32 34.4	12 12.9	16 17.2	12	93 29.2			
46-I can identify the parts of a farm tractor.	Land Laboratory	11 10.5	14 38.1	22 21.0	5 4.8	27 25.7		105 32.7	33.41	8	.000*
	Home Production	9 7.3	44 35.8	38 30.9	11 8.9	21 17.1		123 38.3			
	Agribusiness	5 5.4	21 22.6	48 51.6	12 12.9	7 7.5	10	93 29.0			
47-I can time the ignition system of a tractor.	Land Laboratory	13 12.5	41 39.4	16 15.4	2 1.9	32 30.8		104 32.4	31.20	8	.000*
	Home Production	9 7.3	41 33.1	34 27.4	8 6.5	32 25.8		124 38.6			
	Agribusiness	8 8.6	29 31.2	35 37.6	12 12.9	9 9.7	10	93 29.0			
48-I can remove and explain the functions and replace the fuel tank, lines, and filters, check the system for leaks and damage, and make the necessary repairs of a tractor.	Land Laboratory	9 8.6	36 34.3	23 21.9	8 7.6	29 27.6		105 32.6	51.13	8	.000*
	Home Production	8 6.5	31 25.0	52 41.9	12 9.7	21 16.9		124 38.5			
	Agribusiness	2 2.2	15 16.1	56 60.2	17 18.3	3 3.2	9	93 28.9			
49-I can both remove explain the functions and and replace the thermostat and check the complete unit for leaks on a tractor.	Land Laboratory	9 8.6	24 22.9	32 30.5	8 7.6	32 30.5		105 32.6	28.30	8	.000*
	Home Production	6 4.8	35 28.2	41 33.1	11 8.9	31 25.0		124 38.5			
	Agribusiness	2 2.2	19 20.4	50 53.8	14 15.1	8 8.6	9	93 28.9			

TABLE D2

Continued

Competency Statement	Focus on S.O.E.P.	Frequency of Response						Total N/ %	Chi sq. df Sign		
		Cannot do N/ %	Can do with help N/ %	Can do by myself N/ %	Can show others how N/ %	Have not been taught N/ %	No Response				
50-I can identify the parts of selected farm implements based on the operator's manual.	Land Laboratory	7 6.7	18 17.1	39 37.1	10 9.5	31 29.5		105 32.6	29.68	8	.000*
	Home Production	5 4.0	24 19.4	67 54.0	12 9.7	16 12.9		124 38.9			
	Agribusiness	3 3.2	19 20.4	48 51.6	18 19.4	5 5.4	9	93 28.9			
51-I can inspect and replace worn parts of a weed sprayer.	Land Laboratory	7 6.7	31 29.5	23 21.9	10 9.5	34 32.4		105 32.6	32.69	8	.000*
	Home Production	7 5.6	30 24.2	52 21.9	9 7.3	26 21.0		124 38.5			
	Agribusiness	2 2.2	33 35.5	42 45.2	11 11.8	5 5.4	9	93 28.9			
52-I can adjust a trailer mounted or semi-mounted plow.	Land Laboratory	8 7.6	30 28.6	29 27.6	9 8.6	29 27.6		105 32.6	29.60	8	.000*
	Home Production	7 5.6	38 30.6	52 41.9	8 6.5	19 15.3		124 38.5			
	Agribusiness	3 3.2	19 20.4	48 51.6	16 17.2	7 7.5	9	93 28.9			

*-Significant at $\alpha = .05$