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An experimental evaluation of an instructional packet on supervised occupational experience programs for beginning vocational agriculture students in Iowa

by

Gary Edwin Briers

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CHAPTER I.

INTRODUCTION[1]

The need for practical experiences related to subject matter studied in agricultural classes has long been recognized by agricultural educators. Early training in agriculture for students of less than college grade was provided largely by boarding schools. To make the training practical, the schools provided land, equipment, livestock, and buildings, and required students to engage in farming activities. These "dormitory-school plants were costly both to establish and to maintain" (Stimson and Lathrop, 1942, p. 583).

As more and more secondary schools began offering instruction in agriculture, boarding schools were less needed. Indeed,

> The compulsory-student-labor plan followed in the early dormitory schools proved impractical, largely because it brought together too many individuals engaged in a limited amount and variety of farm activities. . . .A new concept eventually appeared--the school and home-farm cooperation idea (Stimson and Lathrop, 1942, p. 584).

While students were studying agricultural concepts at local high schools, they could apply the knowledge under the direction of their instructors at home.

Today, the concept of applying knowledge and skills learned at school to each individual student's situation under the supervision

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[1]As part of Project 2150 of the Iowa Agriculture and Home Economics Experiment Station, the research procedures for this study were reviewed and approved by the Agriculture and Home Economics Experiment Station Committee on the Protection of Human Rights.

of the vocational agriculture instructor is known as supervised occupational experience (SOE). Since the beginning, vocational educators in agriculture have recognized the value of this educational method. In fact, the Smith-Hughes Act of 1917, which provided federal aid for the promotion of vocational education, required that schools offering vocational agriculture ". . .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" (Stimson, 1919, p. 19-20).

Educators still recognize the educational methods of SOE, and researchers have found that students consistently give it a high rating as a component of instruction in vocational agriculture. Recently, Williams (1977a) discovered that vocational agriculture students in Iowa view their supervised occupational experiences (SOE) as important in developing occupational abilities.

Because most students enter high school and vocational agriculture at age 14, they need guidance in selecting, planning, and developing experiences in agricultural occupations. Individual attention at this time may be very important. Stimson (1919) wrote that the instructor should assist students privately and give careful attention to the individual needs of each pupil, taking into account the peculiar facilities, equipment, and other resources available to each student in a class. In developing a program, the teacher needs to elicit parental support and cooperation, and all parties should fully understand the SOE program, its methods and goals.

Researchers emphasize particularly the need for planning. The responsibility for directing this planning rests with the teacher of vocational agriculture (Magill, 1933). More recently, Miller (1974) wrote how the teacher may fulfill his role as a director of this planning process. He advocated teaching SOE as a part of the regular classroom instructional program so students may "learn the 'what', 'why', and 'how' of supervised occupational experience" (p. 147). Students who, with professional counseling, select their own goals and then are given to understand the processes involved in attaining them, are most likely to respond positively to the educational experience.

Iowa senior vocational agriculture students rated (1) parents, (2) vocational agriculture classes, and (3) help given by their vocational agriculture teachers as significant factors in their SOE (Williams, 1978). The latter two factors support the writings of Miller (1974). Apparently, educators and students agree that the vocational agriculture teacher is a director of SOE planning, and the vocational agriculture class is one of the appropriate settings to conduct this process.

Statement of the Problem

Supervised occupational experience has a distinct and important place in vocational education in agriculture, both historically and presently. Educators and students alike recognize the value of the vocational agriculture teacher and class in initiating and conducting

SOE programs. In a national project to identify and validate standards for vocational agriculture programs, supervised occupational experience was categorized as an important requisite to a quality vocational agriculture program (Agricultural Education Department, 1977). Sadly, other demands on vocational agriculture teachers' time have inhibited their effectiveness in helping students initiate and conduct SOE programs.

An integral part of SOE program development should include preparatory instruction on SOE to beginning vocational agriculture students. Given the constraints faced by the vocational agriculture teacher--minimal time, large class size, increased numbers of classes--a great deal of this teaching must be group instruction (Miller, 1974).

The dilemma arises of how to provide adequate instruction on SOE, with teacher preparatory time at a premium. One solution might be to provide teachers with an instructional packet on SOE programs. This could provide the subject matter content and instructional techniques, thus reducing the preparation time needed by the teacher and insuring appropriate content. To fill this need, an instructional packet on SOE programs for beginning vocational agriculture students was developed by staff members in the Agricultural Education Department at Iowa State University.

The problem, then, with which this study was concerned was: How effective was the instructional packet on SOE programs?

Purpose of the Study

The purpose of this study was to evaluate an instructional packet on supervised occupational experience programs for beginning vocational agriculture students in Iowa. The specific objectives of this research were to:

(1) Identify personal and situational characteristics of beginning vocational agriculture students in Iowa.

(2) Identify occupational and educational plans of beginning vocational agriculture students in Iowa.

(3) Determine if significant relationships exist among student characteristics, their occupational and educational plans, and student performance on an SOE knowledge test, an SOE attitude scale, and an SOE planning inventory.

(4) Determine the effectiveness of an instructional packet on SOE as evaluated by:

   (a) Student knowledge of SOE,

   (b) Student attitude toward SOE, and

   (c) Student SOE program planning.

Need for the Study

With expanded offerings in vocational agriculture have come requests by teachers for instructional materials. Many universities, curriculum materials development centers, and commercial firms have responded to these pleas by preparing and distributing instructional

materials on a wide variety of subject matter areas. This increased production of materials has not been matched by evaluations to determine their effectiveness in increasing student cognitive knowledge, in affecting student attitudes, and in helping students develop skills (Gliem, 1976).

Gliem (1976) recommended that studies be conducted to evaluate changes in knowledge, attitudes, and abilities of students as a result of instructional materials. In an earlier study, Ridenour (1965) emphasized the need for instructional materials evaluation. He stated that both formal and informal evaluative procedures which would determine the effectiveness of materials should be used. Similarly, Kaas (1976) advocated additional research on the teaching-learning value of instructional materials.

In summary, several agricultural educators have suggested that the development, distribution, and use of instructional materials is not adequate. One must go further with this process to reach its conclusion--the logical, systematic evaluation of materials to ascertain their real educational value. In other words, do the instructional materials cause desired behavioral changes in students?

Background for the Study

> The Vocational Education Act of 1963 provides the authority and establishes a mandate for agriculture educators to prepare individuals for any agricultural occupation in which knowledge and skill in agriculture subjects is involved. . . .The tradition of 'learning

> by doing' continues to receive emphasis. However, changes in agricultural employment and education require a revision in the norm of student participation. . . .Occupational experience must be viewed on an enlarged screen in reference to new conditions (Martin, 1967, p. 3, 5).

Recognizing that supervised occupational experience needed evaluation and change, the Agricultural Education Department at Iowa State University requested funds for a project from the Agriculture and Home Economics Experiment Station. This project, funded in 1975, proposed the following objectives:

1. To identify supervised occupational experiences in agriculture obtained by students enrolled in vocational agriculture in Iowa.

2. To assess the effectiveness of supervised occupational experiences in preparing students for work in agricultural occupations.

3. To determine factors which inhibit or stimulate the development of supervised occupational experiences for students enrolled in vocational agriculture.

4. To develop a guide for use in planning, conducting, and interpreting supervised occupational experiences for students enrolled in vocational agriculture in Iowa.

5. To pilot test the guide developed for planning, conducting and interpreting supervised occupational experiences for vocational agriculture students (Williams, 1975, p. 2).

The first three objectives were accomplished under the direction of project leader, Dr. David L. Williams, and reported in A Study of Supervised Occupational Experience Programs of Iowa Vocational Agriculture Students (Williams, 1977a). Based on the findings in this

study, an instructional packet was developed by Williams and associates to achieve the fourth objective. Finally, this study is concerned with the fifth objective--evaluating the instructional guide or packet.

Definition of Terms

Supervised occupational experience (SOE) refers to all planned agricultural activities of educational value conducted by a vocational agriculture student outside of class for which systematic instruction and supervision are provided.

Beginning vocational agriculture student refers to a student enrolled in the initial agriculture course in an approved program of vocational agriculture in Iowa. This course may be entitled Vocational Agriculture I or another similar title.

Instructional packet refers to a collection of printed materials outlining subject matter and suggesting teaching methodology for the teacher of vocational agriculture.

Project team refers to staff members in the Agricultural Education Department at Iowa State University who worked on Project 2150--Developing Supervised Occupational Experiences in Agriculture--of the Iowa Agriculture and Home Economics Experiment Station.

School refers to the Iowa high schools in which the experiment was conducted. Also, the term may be used to represent the vocational agriculture program or beginning vocational agriculture class that participated in the study.

CHAPTER II.

REVIEW OF LITERATURE

This chapter presents a review of relevant literature; the rationale and theoretical framework for the study were drawn from this literature. Included are summaries of research on supervised occupational experience (SOE) in agriculture and review of experimental studies on instructional materials evaluation in vocational agriculture.

Review of Literature on SOE in Vocational Agriculture

In an antecedent phase of the larger research project under which this study falls, a rather thorough review of historical and philosophical literature and "opinion" writings on SOE was presented (Williams, 1977a). The review presented here examines other printed matter on SOE--primarily on SOE research--rather than duplicate the earlier work. Therefore, this review should not be viewed as a comprehensive review of SOE literature; rather, it should be seen as complementary to the prior efforts.

As early as 1924, only seven years after passage of the Smith-Hughes Act, research was being conducted to study the use of supervised occupational experience in teaching vocational agriculture. Hill (1924) did an historical study to determine the reasons for adoption of the home project as a part of agricultural education. Further, he wished to determine how the home project was used in the

"early days," its aims and its purposes. He found that teachers in Illinois believed the project should be used as a teaching device rather than as a means of applying theories. His findings, then, confirmed that early vocational educators in agriculture believed in the value of and used supervised farm practice in teaching vocational agriculture.

Early literature on vocational education in agriculture outlined the teacher's role in providing supervised practice for pupils studying vocational agriculture. The responsibilities of the teacher included (1) providing ample supervised practice, (2) supervising the preparation of a student's plan of procedure for conducting supervised practice, (3) supervising farm practice, and (4) measuring the pupil's proficiency in performing farm practice (Maltby, 1930). This bulletin, prepared by national policy makers in vocational agriculture, suggested explicitly that the teacher assist students in learning about and preparing for participation in agricultural activities. Nonetheless, the major responsibility to develop a suitable program of activities rested on the student.

With the idea that supervised occupational experience (or supervised farm practice as the method was then called) was important educationally, and even required, Spanton (1932) wrote guidelines for training teachers in supervised farm practice methods. He studied the amount, kinds, and nature of pre-employment training that was necessary to conduct supervised farm practice and that should be offered to prospective teachers by teacher-training institutions. Based on an analysis

of activities performed by teachers in conducting SOE programs, he developed a checklist to secure reactions from teachers, teacher trainers, and state supervisors on methods used and recommended for use in providing pre-employment training. His findings revealed that teacher trainees did need instruction on supervising farm practice, and he recommended learning activities for practicing this supervision. In essence, then, his research resulted in instructional techniques for training prospective vocational agriculture teachers in methods and techniques for selecting, planning, and conducting SOE program activities with students.

At about the same time, Sanders (1932) published a report outlining ways of planning supervised farm practice. Through his research and development activities, Sanders identified 10 teaching jobs for the teacher in directing students to plan their farm practice programs: (1) survey the home farm, (2) select the farm type (grain, livestock, or both), (3) set up an ideal training program, (4) estimate prospective returns, (5) identify finances and/or methods of financing, (6) make a final selection of enterprises and other activities, (7) develop production or job standards, (8) secure a business agreement, (9) analyze selected enterprises and evaluate jobs to be planned in detail, and (10) plan specific farm jobs and activities. These procedures pointed out a definite approach to planning farming activities with students.

The job of launching a student on a worthwhile program of farming must be initiated before the formal school session started, according to Williams (1932). Furthermore, this job should be continued with

intensity for about one month after school started. So, Williams believed that class time should be used to orient each student and develop his individual learning program--his program of farm practice. The steps to be completed in accomplishing this job were almost identical to those listed by Sanders (1932). Several of Sanders' processes, however, were grouped together by Williams (1932): (1) determine the type of farming based on home farm survey, surveys of the community and enterprise possibilities, and budgets of time and labor required; (2) select an enterprise or enterprises based on costs, previous experience, and income and expense budgets of selected enterprises; (3) set up standards of practice; and (4) record detailed project planning.

A more studious report by Allen (1932) also looked at the activities of teachers of vocational agriculture in utilizing the pupils' home farm resources for farm practice. The purpose of his study was to discern procedures used by teachers to secure organized opportunities on home farms for students to engage in farm activities. These activities, under the teacher's direction, were selected as appropriate to an effective education in farming. Allen visited several New York and West Virginia vocational agriculture departments and students' homes for personal interviews. His observations were limited to summer activities of the teachers and students. Interestingly, he reported on the importance of collaboration between parents and students, including agreement on definite plans and joint appraisal of pupils' abilities, capacities,

and interests. Parents, teachers, and students should inventory farm resources and set up achievement goals. Finally, the teachers wanted to secure assurance of parental support--for guidance, supervising assistance, evaluation, and interpretation of farm practice by students.

Apparently, early practitioners and policy-makers in vocational agriculture agreed on the value of supervised experience and the means of helping students to plan for this experience. The role of the vocational agriculture teacher was evident; moreover, activities to fulfill this role as suggested by agricultural educators were similar.

Another policy statement was issued by Ross, Clements, and Johnson in 1944 which outlined their concept of farming programs. It introduced and legitimized the term "supervised farming program" as a change from supervised farm practice. According to the bulletin, supervised farming programs were an integral part of vocational agriculture, not an appendage. The instructor, then, must explain carefully and emphasize from a practical standpoint the purposes and values of supervised farming to both parents and students. He should discuss supervised farming at the home farm and during special parents meetings. Equally important, the vocational agriculture instructor should offer individual, group, and class instruction to assist students in developing their farming programs.

For successful establishment, Ross, Clements, and Johnson (1944) wrote that the cooperation of parents in conducting students' programs was the first essential. Furthermore, they believed the instructor could best secure this cooperation by taking definite steps to acquaint

parents with the objectives of and procedures used in developing supervised farming programs. Early contacts—visits at home during the summer--were important in establishing this parent-teacher working relationship.

They cautioned instructors against only informing students:

> Frequently instructors have depended too much upon the student to explain to his parents the purposes of and procedures followed in conducting the supervised farming program. This weakness is apparent when we consider that in most cases the student himself is not given adequate instruction along those lines. . .(p. 31).

How, then, did they recommend that parental orientation be done? Project tours with parents and students, circular letters sent to parents early in the first year of vocational agriculture, and meetings were suggested. In fact, a series of meetings could be used to (1) explain the objectives of vocational agriculture and supervised farming, (2) show examples of good farming programs, (3) outline course content and methods, and (4) select enterprises and establish written agreements.

The concept of improving supervised farming programs through parental cooperation was researched by Shaw (1947). He studied methods used by teachers in North Carolina to familiarize parents of vocational agriculture students with the vocational agriculture program. Next, he attempted to get ideas of teachers, supervisors, and teacher trainers on ways of securing parental cooperation and interest in the program, and he developed a plan for meetings with parents. These developmental steps were based on information he collected with a questionnaire and

from personal interviews. In his research, Shaw found that teachers of vocational agriculture in North Carolina considered the cooperation of parents to be vitally important in developing superior supervised farming programs. Of primary importance was student interest with parental cooperation second. Student interest in supervised farming, however, was greatly influenced by the attitude of their parents toward this educational method. Finally, Shaw (1947) outlined a series of eight meetings to be held with parents of vocational agriculture students, beginning in September and held weekly. The value of parental cooperation, then, was verified, and procedures for capitalizing on this asset were defined.

Two studies were completed during the 1940's which measured students' opinions of supervised farming programs and supervision by the teachers. First, Evans (1942) determined pupil reactions to supervision and visitation which they wished to have from their vocational agriculture teachers. To get these reactions, he mailed questionnaires to 50 teachers, who in turn distributed them to students. He emphasized that the response should be from the students. Evans found that 90 percent of the students liked to have the instructor help them select their projects. A majority wished to have a joint meeting with parents and the teacher to draw up project agreements. In summary, students desired help from the teacher in planning their supervised farming program in connection with classroom instruction.

A second study, by Shontz (1945), attempted to improve supervised farming based on the opinions of former students who were established

in farming. One of his purposes was to determine activities and responsibilities (in relation to farming programs) of teachers, pupils, and parents. He sampled 230 young farmers who were former vocational agriculture students; they responded to various activities of the people involved. Among his findings, he discovered that the programs included projects of genuine interest to the pupils and motivated pupils in pursuing the curriculum as a whole. Planning, however, was a weak feature of many programs. Some students failed to (1) make home farm analyses, (2) study programs of successful farmers, (3) make long time plans during the first year of study, (4) set up budgets, and/or (5) establish goals. These findings suggested that supervised farming programs were important and valuable; nevertheless, planning of programs needed improvement.

Deyoe and Masters (1950) also conducted a study to determine some of the procedures used with first year students in selecting and initiating programs of supervised farming. Among the practices employed by departments with above average supervised farming programs were the following: (1) visited homes early in the year to discuss supervised farming with students and parents; (2) offered a separate class for beginning students; (3) provided class instruction early in the school year on selecting and starting programs of supervised farming; (4) surveyed home farms to determine enterprises, facilities, and needs as a basis for selecting supervised farming activities; (5) used conference periods to discuss farming programs individually with students;

(6) estimated receipts and expenditures of ownership projects under consideration; (7) established business agreements between students and parents; and (8) held group meetings with parents early in the school year to discuss supervised farming programs. This was perhaps the most extensive list of activities to conduct in establishing farming programs with beginning students. These "above average" departments were active, seemingly, in working with first year pupils.

Providing supervised farm practice was not always easy, however. In recognition of this, Young (1940) conducted research to discover factors inhibiting vocational agriculture students from carrying out successfully long time supervised farming programs. Also, he wanted to uncover ways and means used by experienced teachers to eliminate or reduce these factors to a minimum. He personally interviewed 50 experienced teachers, four state supervisors, and four teacher trainers to identify problems and means of overcoming them. Three groups of inhibitors were discovered. Parental factors included tenant (not owner) farmers, unsuccessful farmers, and unfavorable attitudes toward farming and toward education. A group of environmental factors was represented by small farms and poor quality soil, poultry, and livestock. Finally, student characteristics--low intelligence and lack of interest--constituted a problem group. Means of overcoming or reducing these inhibiting factors included (1) conferences with parents, (2) project tours, (3) fairs and exhibits, (4) FFA degrees, (5) encouragement of enterprises common in the community but not carried at home, and (6) starting students of low intelligence with simple programs.

Several studies were conducted during the early 1950's to examine the development of supervised farming programs by beginning students. Each of these studies used questionnaire and/or interview techniques to collect information from vocational agriculture teachers, teacher educators, state supervisors, parents, and/or students. Being descriptive research with some developmental aspects, the studies gave good accounts of existing situations and, in most cases, offered suggestions for SOE program development. Nevertheless, none of the studies investigated whether or not the proposed improvements were in fact better than what was currently being used.

Warren (1952), for example, merely identified problems that were most difficult for the vocational agriculture teacher in developing and conducting supervised farming programs. Planning supervised practice was one of the problems listed. Suggestions for planning SOE programs were offered by Abrams (1950). First, he found that teachers and state supervisors believed students should have facilities for supervised farming programs before enrolling in vocational agriculture. Then, the first part of the school year should be used to assist students in developing a four year farming program. Parents should be consulted in the planning of programs and approve the program selected.

Specific practices used by teachers in launching beginning students in their programs were identified by Davis (1953), and he analyzed "weak links" in the process. Two areas for improvement were particularly significant to this study: (1) developing cooperative relationships with parents, and (2) using an orientation unit to provide better

student understanding of the purposes of supervised farming. Taylor (1951) specified that greater use of motivational and promotional activities would enhance the instructional phase of supervised farming program development. Also, he proposed a course in supervised farming for prospective and inservice teachers.

The idea for using classroom time to teach about supervised farming was explored further by King (1953). He listed, among 11 jobs, the following eight steps which might be carried out in a classroom setting: (1) determine requirements for a good supervised farming program, (2) survey the home farm, (3) draw map of home farm, (4) determine possibilities of various enterprises, (5) choose productive, supplementary, and improvement projects, (6) determine records to keep, (7) develop business agreements, and (8) make a calendar of jobs to perform. The time spent by teachers in setting up farming programs in this fashion averaged almost 18 hours.

Deems (1950) found that one of the factors associated with larger supervised farming programs of students was the amount of time spent in the classroom discussing the kinds of programs, possible projects, and available equipment. Similarly, Timmerman (1956) reported on techniques used by teachers to create and maintain interest in supervised farming. He found that taking class trips and discussing opportunities for learning and profit were useful. Teachers also discussed accomplishments of other students and program requirements to motivate students.

So, according to several studies, classroom instruction was valuable in helping students initiate programs of supervised farming. Parental support and cooperation were also important. These studies, however, were mainly descriptive. The unanswered question is, "What evidence is there that these practices--recommended by teachers, confirmed by students, and supported by parents--are actually effective for selecting, planning, and developing SOE programs with students?"

A study reported in 1942 by Rodeberg compared vocational agriculture departments whose students had superior supervised farming programs with departments having poorer student farming programs. He found that the "superior departments" conducted more organized instruction on supervised farming. Teachers in these departments also selected and planned SOE programs more carefully through setting of definite student goals and providing both group and individual studies as a major part of class instruction. This evidence indicated that recommended practices were indeed successful in helping beginning students launch their supervised farming programs.

Later, Garner (1951) conducted a study of practices used by two groups of teachers of varying proficiency in conducting supervised farming programs. The purpose of his study was to answer two questions: (1) Do teachers in the two groups follow the practices recommended by leaders in agricultural education? and (2) What are the reasons for variable practices among the teachers in the two groups? To answer these questions, he rank ordered 84 Michigan vocational agriculture teachers by applying nine measures of effectiveness to recorded data

of their local programs of supervised farming. These measures were developed with the assistance of a jury of experts. Then, the 13 teachers determined to have the most effective programs and the 13 with less effective programs were interviewed. Additionally, the researcher interviewed representative students and/or the students' parents. Before the interviews, 10 statements of working principles in conducting supervised farming programs were devised by a review of literature. These statements reflected the principles and practices recommended by leading agricultural educators. The questions asked during the interview were designed to reveal the extent to which teachers were using the recommended practices.

A significantly greater number of the teachers with effective programs used recommended practices. Among the practices were the following: (1) visited prospective students to provide guidance and counseling; (2) informed prospective students that a supervised farming program was required; (3) gave considerable classroom instruction on supervised farming programs; (4) took beginning students to observe farming programs of advanced students; (5) required written supervised farming program plans; (6) conducted annual tours of programs; (7) took pictures of students and their programs; (8) encouraged students to set production goals; (9) developed production records with students; (10) provided timely instruction--when the student needed it; and, (11) supervised the programs often--when or soon after class instruction was provided, during the regular school day, after school, or on Saturdays.

Finally, he analyzed the reasons offered by teachers who failed to use recommended practices. Some of the teachers offered reasons that reflected unfavorable philosophies or beliefs about supervised farming programs. Another significant reason was that the teachers often possessed inadequate abilities or knowledge necessary to carry out many of the practices. In essence, Garner (1951) found that the vocational agriculture teacher and his instructional program greatly affected the quality of students' supervised farming programs.

Perhaps the most extensive study of supervised farming program development was conducted by Binkley (1955). His purpose was to evaluate the supervised farming of high school students in Kentucky and to find out the practices used by teachers in developing the programs. Data from teachers' annual reports were used to divide over 150 departments into three groups based on supervised farming accomplishments. Binkley then developed a questionnaire listing 55 recommended practices in developing farming programs; the form was administered to 30 teachers with "good" supervised farming programs and 30 with "below average" programs. Eighteen of the 55 practices dealt with procedures for guiding beginning students in selecting and planning farming programs. These 18 practices were recognized by teacher trainers, state supervisors, and "good supervised farming program" teachers not only as valuable but also were used by a large percentage of the teachers:

1. Using a sizeable block of time [identified later as 15 or more days] for basic instruction in supervised farming before planning projects.

2. Dealing with the parts of a farming program, what constitutes a good farming program, and reasons for having a farming program.

3. Studying, in class, farming programs of older or former students.

4. Studying, in class, farming programs of Kentucky Farmers from the local chapter.

5. Having older students appear before the class and describe their farming programs.

6. Taking the class to visit and study a farming program of an older student.

7. Using 'home-farm facts' of students in guiding them in selecting their farming programs.

8. Guiding the class to set up production goals for the main crop and livestock enterprises in the community.

9. Figuring through, with the class, probable return from the chief productive enterprise in the community.

10. Guiding the class to see that degree advancement in the FFA depends very largely upon farming programs.

11. Dealing with what constitutes a good trade agreement.

12. Using 'Standards for Farming Programs of High School Boys' as a reference when guiding beginning students in selecting and planning farming programs.

13. Holding one or more group meetings of parents of first-year students before the boys plan projects.

14. Having boys work out trade agreements with their landlords (to include parents) for each project.

15. Having boys write project plans. . .for each project they are to have in their farming program.

16. Completing most project plans. . .for beginning boys by December 15.

17. Visiting each beginning boy at least twice before the end of the first semester.

18. Providing an award or recognition for boy or boys who have the best supervised farming programs (Binkley, 1955, pp. 95-97).

Binkley concluded by recommending that teachers develop a good series of lessons to motivate students in selecting and planning challenging farming programs.

Only one research study completed in the 1960's was found that dealt specifically with the development of supervised farming programs of students. Mabe (1964) identified several opportunity situations that contribute to a successful farming program. Factors involving "student situation" included interest in agriculture and attitude toward productive enterprises. Other situations centered around the home farm, the school, parents, and the teacher. This study pointed out the idea that student attitudes toward SOE and interest in agriculture as well as intervening student, school, teacher, and parental factors influence significantly the development of supervised farming programs.

Since 1964, very little research has been conducted to look specifically at beginning students' SOE program development. Similarly, few Iowa studies have dealt with the problem of SOE program development. One study, reported by Sweaney and Starrak (1941), ascertained methods used by instructors which contributed to the success of effective programs of supervised farming practice in Iowa. Their only finding

relative to this purpose was that instructors made frequent use of class time in planning and promoting the supervised farming programs of their students.

Another Iowa study was completed by Knecht (1959). He investigated the factors that might contribute to the success of a students' farming program, and he found only two factors that seemed to affect programs positively: enrollment in vocational agriculture for four years and fathers with good educational backgrounds. Knecht, however, did not include in his survey form many of the practices and procedures recommended for helping students develop farming programs. Rather, he was observing situational or static variables.

For the purpose of this review, the most recent research efforts concerning SOE programs have been conducted in Virginia, West Virginia, and Iowa. McMillion and Auville (1976) attempted to identify factors which account for significant variation in supervised farming programs of high school vocational agriculture students. They interviewed teachers and junior and senior students, studied state reports, and viewed student record books to accomplish this purpose. As an indicator of the size or scope of students' farming programs, the researchers developed a "Farming Program Score" (p. 22). The value of land, buildings and equipment, labor income, and Productive Man Work Day (PMWD) units were considered in evaluating the supervised farming programs, and a scale was developed by summing points assigned to the value of these indicators to produce the Farming Program Score.

Among the factors found to influence Farming Program Scores were: (1) amount of class time per year used for supervised farming instruction and (2) use of parent orientation programs. Scores were higher for students whose teachers spent from 11 to 15 days per year for supervised farming instruction; they were also higher for teachers having parent orientation programs. So, in an effort to increase the successful development of SOE programs by students, one should consider these two variables.

Lawrence and Bean (1977) investigated the reasons students drop vocational agriculture after the first year of study. They discovered that the SOE program is a significant factor in retention of students in vocational agriculture. Of students who developed some type of experience program, only 22 percent dropped vocational agriculture. On the other hand, 90 percent of the students who did not have SOE programs dropped vocational agriculture. Furthermore, as the income from SOE programs increased, more students tended to retain their enrollment in vocational agriculture. These results suggest that teachers should "encourage first-year students to establish challenging and profitable experience programs. . . .More teachers need to impress upon their students the value of scope in occupational experience programs" (Lawrence and Bean, 1977, p. 162). Finally, students who received more supervisory visits became second-year students, suggesting that teachers should supervise experience programs more frequently.

In Iowa, antecedents to this study were reported by Williams (1977a, 1977b) and Williams and Rawls (1977). Supervised farming

programs remain the dominant type of SOE program in Iowa. Of the students with SOE programs, 80 percent participated in supervised farming programs in vocational agriculture (Williams and Rawls, 1977). Furthermore, since less than a third of these students had farming programs as their final SOE, one may assume that many begin with supervised farming programs. Student labor regulations further restrict fourteen-year-old beginning vocational agriculture students on their SOE program. So, in launching beginning students on their SOE programs, teachers in Iowa should concentrate on supervised farming programs.

Williams (1977a) studied students' perceived importance of SOE in developing selected occupational abilities. He found that these senior students viewed their SOE as above average in importance in developing each of 38 occupational abilities. This suggests that SOE programs are definitely important as a learning method in vocational agriculture.

When asked to rate selected factors in developing SOE programs, students identified the following as most important: (1) my parents, (2) my vocational agriculture classes, (3) the wages and/or profits earned from SOE, (4) the help given to me by my vocational agriculture teacher(s), and (5) the training or experience plan developed for my SOE (Williams, 1977b). Another factor that was above average in importance was "the agreement developed for my SOE". These findings suggest ways of improving the quality of SOE provided through vocational agriculture. For instance, the factors viewed by students as important

in developing SOE programs should be activated by teachers, curriculum specialists, and curriculum material writers.

Summary for SOE literature

Numerous research studies have been conducted in the area of supervised occupational experience in vocational agriculture. Most of the studies, however, were completed prior to the passage of the 1963 Vocational Education Acts. Nevertheless, results from these early studies indicated (1) that students, parents, teachers, teacher educators, and state supervisors believe SOE is an important method of instruction in vocational agriculture, (2) that various factors and procedures are effective in assisting students to initiate successful SOE programs, and (3) that the vocational agriculture teacher and class play major roles in the process of SOE development. One of the impetuses to successful SOE programs is classroom instruction on the purposes and types of SOE programs and steps in their selection and development. The purpose of this study was to evaluate an instructional packet on SOE programs for beginning students of vocational agriculture. One question that remains to be answered is, "How should one proceed in this evaluation process?"

Review of Literature on Evaluation of Vocational Agriculture Instructional Materials

An important problem for educators is selecting instructional materials to use in teaching. This selection procedure involves consideration by the teacher of such quesions as:

1. Does the instructional material "cover the subject matter I wish to teach"?
2. Is the difficulty level about "right"?
3. Are the materials economical?
4. Should the materials be used as a teacher reference, a student reference, a textbook, etc.?

The overriding concern of educators, however, is whether or not the instructional materials will assist the teacher in accomplishing the objectives for which he or she is striving (Lumsdaine, 1963).

In vocational agriculture, this concern also exists. Several research studies have been conducted to determine the effectiveness of various instructional materials. The purpose of this part of the review of literature is to examine and summarize the findings of research studies in vocational agriculture which have tested the value of teaching materials. The review is limited primarily to experimental evaluations simply because experimental studies are the most rigorous means of establishing a true cause and effect relationship (Kerlinger, 1973).

According to Ridenour (1965), materials in vocational agriculture curriculum development should be structured to enhance the teaching-learning process. And, to ascertain whether ot not this goal has been reached, research must be conducted to determine the educational value of materials. When instructional materials have proven that they improve student learning, then they should be disseminated to teachers.

Tillman (1976) identified that an important problem faced by vocational agriculture teachers during the past 55 years was finding instructional materials to use in teaching vocational agriculture classes. As a result, he conducted a study for the purpose of determining the extent that Virginia vocational agriculture teachers were using instructional materials developed by the Agricultural Education Program Area at Virginia Polytechnic Institute and State University. Furthermore, he wanted to discover what "special features" to include in new instructional materials--transparencies, workbooks, exercise sheets, teacher's keys, and others. His questionnaire listed 17 materials which had been developed and disseminated. The vocational agriculture teachers rated all 17 instructional materials as "good"; he also found that teachers wanted transparency masters, student workbooks, tear-out pages, and teacher's keys included in the materials.

A relatively early experimental study on vocational agriculture instructional techniques was completed and reported by Shontz in 1963. He compared the educational effectiveness of three methods of teaching agricultural occupations information associated with land use and conservation. To conduct the study, Shontz chose 24 Pennsylvania schools and assigned eight of them to one of three different teaching methods. All together, 424 ninth and tenth grade students of vocational agriculture were involved in the study. Eighteen hours of instructional time were used in each approach. The three methods were identified as follows:

Integrated method - Each teacher was furnished a teaching plan combining information on agricultural occupations and land use and conservation to be taught in an integrated procedure. Provided were up-to-date materials on both agricultural occupations and land use and conservation.

Separate units method - A teaching plan for agricultural occupations and one for land use and conservation were supplied. The information was taught separate, but the same resource materials were provided as for the integrated method.

Instructor's own method - Each instructor prepared his own teaching plan for land use and conservation. The unit was based upon a furnished list of titles of the six problem areas in the unit. In this control group, teachers used their own customary teaching procedures and resource materials.

An analysis of covariance design was employed with pretests to control initial differences. The criterion measures were (1) a test on knowledge of agricultural occupations, (2) a test on knowledge of land use and conservation, (3) a checklist of expressed occupational interest in 20 occupations associated with land use and conservation, and (4) the Kuder Preference Record - Occupational Form D.

Shontz (1963) found that the integrated and separate teaching units were not significantly different in effecting student achievement on either of the two knowledge tests. Both, however, were superior to the instructor's own method. This suggested that the materials were the

real cause of increased knowledge. No differences existed among the groups on the other two measures. He concluded by stating that organized instructional units were valuable for effective teaching.

Ehresman (1966) conducted research similar to Shontz's; he did an experimental study to evaluate the effectiveness of structured, printed instructional materials on agricultural cooperatives. He compared the structured materials to a "control"--unstructured, printed instructional materials--in two groups of 10 Illinois schools. His experimental design was a pretest-posttest control group design. The experimental variable was the structured source unit, which was designed to assist teachers in organizing and teaching a unit on agricultural cooperatives. To ascertain the effectiveness of this experimental variable, Ehresman tested pupils' knowledge of cooperatives at the end of the unit.

His findings showed no differences in the mean posttest scores of pupils; however, the reactions of teachers using the structured instructional materials were favorable. Ehresman (1966) concluded that structured source units may be a valuable aid because of the time saved during planning and preparation. In his conclusion, he also stated:

> Maximum benefits from structured instructional materials may not be realized unless teachers are aware of the materials and are given the assistance in utilizing the materials (Ehresman, 1966, p. 2006-A).

Finally, the researcher opined that preparation of materials for teachers was not enough. He proposed that teachers need to be informed of the assistance materials provide and that they must be motivated to make effective use of materials.

Instructional materials, alone, may not be powerful enough to effect student learning. With this theory in mind, Barker (1967) conducted an appraisal of instructional units and approaches to teaching and learning. The units, written to enhance student understanding of profit-maximizing principles, were designed to be taught by inductive teaching processes with a discovery approach to learning.

Twenty-two schools in Ohio were chosen for the study, and the units were taught to junior and senior students enrolled in vocational agriculture. The schools were assigned to three different treatment levels: six schools as a control, seven as a "pilot-block" to teach from the units in an uninterrupted sequence of approximately six weeks, and nine schools as "pilot-integrated". The "pilot-integrated" schools used the same materials as the "pilot-block" group, but they integrated the materials with other subject matter during a five-month trial period.

Barker (1967) measured student understanding through the use of an evaluative posttest. This instrument, which served as the primary method of evaluation, had 45 multiple choice questions. The results revealed that the pilot-block group obtained the highest score on the posttest, followed by the pilot-integrated group, and finally, the control schools. These group mean differences were significant statistically as well.

In the studies already reviewed, student cognitive knowledge served as the primary criterion measure to evaluate the effectiveness of instructional materials. In 1971, Urbanic reported on his research

of a student reference in teaching ornamental horticulture. Besides evaluating the reference in terms of its effect on student knowledge, he determined attitudes toward student references. A posttest-only control group design was used with eight schools in both the experimental and control treatment groups. Attitude scales were developed and used to measure student and teacher attitudes toward student references, behavioral objectives, student exercises, subject matter content, writing styles, and pictures and illustrations.

Urbanic (1971) found no significant differences in knowledge test scores between groups, nor did he find any differences in attitudes between the treatment groups. He did conclude, however, that teachers of vocational horticulture were more favorable toward the use of student references than were their students. Both groups of teachers responded favorably toward the need for student references and acceptance of furnished behavioral objectives. Finally, he indicated that curriculum materials would not increase student learning as long as the materials were given to teachers without proper instruction on their use.

Wilson (1971) studied the effectiveness of varied class time sequences and teaching materials in teaching electricity to high school students. In his purpose, Wilson stated that he wanted to ascertain student achievement in learning basic skills and knowledge in applied electricity. His criterion measures, nevertheless, consisted only of multiple choice questions without any evalution of basic skills developed by students. The tests--one for the teachers, another for the students--were administered as pretests and posttests.

Two groups of schools were involved in the study with 19 schools in the experimental treatment group that used a resource unit to teach electricity. Another 18 teachers were provided only a one-page teaching outline and served as a control. Among his findings, Wilson (1971) reported that students taught by the "resource unit method" scored significantly higher than those taught by the "teaching outline method".

A study reported by Ahrens (1970) was designed to evaluate the use of prepared lesson plans on instruction in vocational agriculture. Six schools were randomly assigned to the prepared lesson plan group, and six were placed in a control group. Problem areas, objectives, and references were determined for each instructional area. An outline was then used for both groups to give instructional uniformity in the selected areas of animal health, commercial fertilizers, small gasoline engines, and farm credit. The manipulated variable in instruction was the use of the prepared lesson plans. Each day's lesson plan provided (1) the problem area, (2) objectives, (3) references, (4) subject matter, (5) teacher and student activities, and (6) worksheets and assignments. Finally, an inservice meeting was provided to instruct the teachers in the use of the techniques and resources to be used in the experiment.

Data were gathered on the students through pretest and posttest measures of student knowledge. Ahrens (1970) was unable to detect a significant difference in achievement of the students taught with prepared lesson plans as compared to those taught without prepared lesson plans. He cautioned future researchers, however, to consider the power of their experiments. The total of 12 classes--the

experimental units--made detection of differences very difficult in his study.

Another procedural concept was used by Gliem (1976). He evaluated the effectiveness of a student reference in teaching ladder safety to vocational agriculture students. Rather than two levels of the independent variable as most previous research had used, Gliem employed three levels: (1) both students and teachers received the student reference; (2) teachers only received the reference; and (3) neither teachers nor students had access to the student reference (control).

In his posttest-only control group design, Gliem (1976) assigned 10 schools to each of the treatment levels. Then, he measured student cognitive knowledge after the teaching of ladder safety. The results of his study revealed that students performed about the same on the cognitive posttest. So, he concluded that the student reference on ladder safety was not any more effective than others that were available to teachers and students.

In a similar study, Geesey (1976) attempted to discover the effect of selected instructional materials in teaching tree identification on the achievement of high school vocational agriculture students. Again, three treatment levels were used: (1) a teacher's guide in combination with a student manual, (2) a student manual only, and (3) references and instructional materials normally used by the teacher. Student achievement was measured by the score on a 65-item tree identification test. Geesey employed a modified Solomon four-group design in which he

assigned 21 intact classes in Ohio to one of the three different treatment levels.

Conclusions drawn by Geesey (1976) were (1) the use of the student manual and teacher's guide made no significant differences in student achievement as compared to students taught tree identification without using the manual and/or guide, but (2) student achievement was positively related to the extent of student use of instructional materials and student interest generated by their use.

A final study was reported by Langham (1977) on the value of instructional materials in farm tractor tune-up. His research was developmental as well as evaluative. In the first phase of his study, Langham had teachers evaluate current instructional materials and give recommendations for improvement of new materials being developed. Secondly, he asked them to review the materials he had developed and evaluate them for use in their programs. His final developmental phase was to evaluate the materials based upon a quasi-experiment using a one group pretest-posttest research design. The independent variable was his instructional materials while the dependent variable was student knowledge.

Langham (1977) found that the instructional materials developed and prepared by him were accepted favorably. Vocational agriculture teachers felt a need for more instructional materials developed in this style. Also, the results indicated that the developed materials were superior to all other instructional sources except personally developed materials. Perhaps most importantly, the developed

instructional materials enhanced student proficiency in the area of farm tractor tune-up.

Summary of instructional materials literature review

Studies which evaluated instructional materials in vocational agriculture gave varying results. Some of the experiments found that the materials were successful in increasing student knowledge of subject matter. On the other hand, several studies did not detect difference in student achievement between experimental and control group treatments. Collectively, the experiments suggest that properly constructed materials and carefully designed experiments combine to result in detectable differences in achievement.

Research procedures also varied from study to study. The most popular experimental designs were the posttest-only control group design and the pretest-posttest control group design. Similarly, the most frequently used criterion measure was student cognitive knowledge. Other criteria included student attitudes and student proficiency in performing skills.

An opinion stated by several researchers was the need to include teacher inservice as a procedure in the development and dissemination of instructional materials. Finally, they suggested that instructional materials continue to be evaluated in order to determine their educational value.

CHAPTER III.

EXECUTION OF STUDY

The primary purpose of this study was to evaluate the effectiveness of the SOE instructional packet in developing students' supervised occupational experience programs. To accomplish this objective, the following methods and procedures were used.

Design

The design for this investigation was a pretest-posttest control group design, described in Campbell and Stanley (1971). The design may be represented graphically as

R	$O_1 O_2 O_3$	X_1	$O_4 O_5 O_6 O_7$
R	$O_8 O_9 O_{10}$	X_2	$O_{11} O_{12} O_{13} O_{14}$

The symbols are explained as follows:

R	indicates random selection from the population and random assignment to the separate treatment groups or levels.
X_1	represents the treatment group in which instructors taught SOE to beginning students using "conventional" materials and methods (the control treatment).
X_2	represents the treatment in which instructors taught SOE to beginning students using the instructional packet developed by the experimental project team.
$O_1 O_2 O_3$, $O_8 O_9 O_{10}$	depict a pretest to measure student knowledge about SOE, a pretest to measure student attitudes toward SOE, and a questionnaire to collect personal and situational information from the students.

$O_4O_5O_6$, $O_{11}O_{12}O_{13}$	depict a posttest to measure student knowledge of SOE, a posttest to measure student attitude toward SOE, and an inventory to measure the "degree" to which students have selected and planned their own individual SOE programs.
O_7, O_{14}	indicate questionnaires designed to collect personal, situational, and procedural information from the teachers.

Population

The population for the study consisted of the vocational agriculture teachers in Iowa during the 1977-1978 school year. Additional restrictions were imposed so that the actual population available for the study was defined as follows:

1. Teachers must have taught in their present school systems during the 1976-1977 school year. This eliminated all beginning instructors and those who had changed positions between the 1976-1977 and 1977-1978 school years.

2. Teachers must have been using the new Iowa Agricultural Experience Program Records (Iowa Vocational Agriculture Teachers Association, 1976).

3. Teachers must have been teaching a class of beginning vocational agriculture students.

4. Teachers must have agreed to teach a unit on SOE programs to their beginning students during fall semester of the 1977-1978 school year.

$O_4 O_5 O_6$, $O_{11} O_{12} O_{13}$	depict a posttest to measure student knowledge of SOE, a posttest to measure student attitude toward SOE, and an inventory to measure the "degree" to which students have selected and planned their own individual SOE programs.
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3. Teachers must have been teaching a class of beginning vocational agriculture students.

4. Teachers must have agreed to teach a unit on SOE programs to their beginning students during fall semester of the 1977-1978 school year.

In the original frame from which the sample was chosen, only criterion 1 was used to delete teachers and their students from inclusion as possible experimental units.

In essence, then, the accessible population consisted of all the vocational agriculture teachers who met the criteria stated above. The target population, however, was considered to be both present and future teachers who meet these criteria. In other words, generalizations and inferences from the sample to the accessible population were made without hesitation; inferences may also be drawn to the larger target population--which might be thought of as the accessible population over time.

Sample

Forty teachers were randomly selected to participate in the study. The investigator also numerically ordered other teachers as alternates to be used as replacements in the event that some of the original 40 teachers did not meet the selection criteria or otherwise could not participate in the study. Superintendents of the teachers selected were then contacted by letter (Appendix A) to get their permission to contact the vocational agriculture teachers and students. Forty-nine superintendents (50 were contacted) gave the researcher permission to contact the teachers. A letter (Appendix A) was then sent to the selected teachers explaining briefly the project and soliciting their approval for participation. The teachers were also informed of the

criteria they must meet to take part in the project. Of the original 40 teachers contacted, four teachers chose not to participate in the study. (Only one of these four teachers stated that he did not meet the criteria established.) The first four alternates agreed to become involved in the project.

According to Borg (1963), one mistake often made by researchers is that they use "too few cases, which leads to large sampling errors and insignificant results" (p. 310). Statistical techniques are available, however, to select a sufficient number of experimental units to insure a reasonable probability of detecting differences between treatment effects. Questions that must be answered by the researcher were summarized by Ostle (1963, p. 138):

1. What significance level [α] are you planning to use?
2. How large a difference do you wish to be reasonably certain of detecting?
3. With what probability [of making a Type II error]?
4. What do you expect the variability of your data to be?

The first and third questions may be answered arbitrarily by the researcher. Typically, a significance level of .05 is chosen in educational research; this value (.05) was used in the experiment. In a similar manner, the probability of making a Type II error (answering question 3) was set at .20. To answer question 2, the researcher must either establish a theoretical difference or estimate a reasonable difference based on similar studies. Variability of data also can be estimated by studying allied research.

The table presented by Ostle (1963, p. 553) to estimate sample size requires the following information:

1. α (the probability of a Type I error--of concluding that treatment means are unequal when, in fact, they are equal). $\alpha = .05$.
2. β (the probability of a Type II error--of concluding that treatment means are equal when, in fact, they are unequal). $\beta = .20$.
3. $D = \delta/\sigma$, where δ = difference between treatment means and σ = standard deviation.

Because population values of the differences between treatment means (δ) and standard deviation (σ) were not known, estimates of their value were found. In an objective test of student knowledge, Gliem (1976) found a difference between treatment means of about 1.7 and a standard deviation of 3.4 ($D = \frac{1.7}{3.4} = .5$). Similarly, Kaas (1976) reported a difference between treatment means of approximately 100 and standard error of 60 ($D = \frac{100}{60} = 1.67$). His values were derived from an objective test of student cognitive knowledge, too. Both measurements were similar to the knowledge measurement used in this study. So, an average of these values was chosen to use as an estimate of the expected value for the D in the experiment.

The value of D used in this study was 1.0 (a conservative average of .5 and 1.7). Entering the table given by Ostle (1963, pp. 552-553), the researcher found "the number of observations needed in each of two

samples of equal size" was 17. Decreasing the probability of a Type II error to .10 (assuming the estimated value of D at 1.0) resulted in a need for equal sized groups of 23. To insure a "reasonable" probability of detecting the difference assumed in this study with variability estimated from similar studies, the researcher chose sample sizes of 20 for both the experimental and control treatment groups.

Description of Treatment Levels

Experimental studies "refer to that portion of research in which variables are manipulated and their effects upon other variables observed" (Campbell and Stanley, 1963, p. 1). In the section entitled "Instrumentation", the dependent variables and their measurement are described. This section describes the independent variable manipulated by the researcher--the "degree" to which teachers and students had access to and used the instructional packet on SOE programs. Two levels of the independent variable were used in the study. The "experimental group" included those teachers and students who used the instructional packet, while the "control group" contained teachers and students who did not have access to the instructional packet. A more detailed description of these two groups or levels follows.

Experimental group

A set of teaching materials entitled An Instructional Packet on Supervised Occupational Experience Programs of Beginning Vocational Agriculture Students (Williams, 1977c) and inservice education provided

to vocational agriculture teachers on the use of the packet constituted the "treatment level" for the "experimental schools".

Instructional packet The instructional packet was developed by David L. Williams and associates as part of the Iowa Agriculture and Home Economics Experiment project entitled "Developing Supervised Occupational Experiences in Agriculture". Research conducted by Williams (1977a) suggested content to be included in the packet and the instructional methodology that should be used. The instructional packet was produced for vocational agriculture teachers to use in teaching beginning vocational agriculture students to select and plan supervised occupational experience (SOE) programs. The packet or unit included three dimensions or problem areas. The first problem area, labeled "Recognizing SOE as a Part of Vocational Agriculture", was designed to help students understand the importance of supervised occupational experience as a means of learning agricultural skills.

The second problem area focused on selecting an SOE program by each student. Instructional activities were suggested that would guide students in selecting their own SOE programs based upon their interests, experiences, and available resources.

"Planning an SOE Program" was the title of the third problem area in the packet. This problem area included learning activities to guide students in developing detailed plans for their SOE programs.

Each of the three problem areas included study questions, a statement of desired student outcomes, specific objectives, teaching

procedures, and a conclusion. A variety of group and individualized learning activities was suggested for each problem area. Masters for student handouts, transparencies, slides and scripts, and letters were provided and suggestions made for their use. A teacher key was provided for each student handout included in the packet. Instructional methods that utilized older students and community adults as resource people were suggested. Also, activities that would keep the parents of students informed and involved in the learning process were prominent throughout the instructional packet.

The packet was designed for approximately 15 class periods (hours) of instruction in beginning vocational agriculture classes. In addition, one evening meeting for students and their parents was suggested in the materials. The vocational agriculture teacher was also asked to visit in the homes of his or her students as part of the instructional model. Teachers were asked to identify the dates they would utilize the packet in their teaching during the fall semester of 1977.

Teacher inservice Copies of the instructional packet were delivered to the vocational agriculture teachers from the experimental schools through group inservice meetings. Teachers were asked to attend an evening meeting where the contents of the packet were reviewed and discussed. Emphasis was placed on the contents of the packet and the instructional methodology suggested. In addition, the teachers were provided instruction on administering the pretest and posttest to their students. A copy of the agenda for the inservice meetings is presented

in Appendix A. Teachers who could not attend the inservice group meeting were given individualized instruction on use of the packet by the people who conducted the group meetings.

Control group

Schools (teachers and students) assigned to the control group were not given the instructional packet. Rather, the teachers were asked to teach what they would ordinarily teach on SOE programs to their beginning students. They were merely instructed to collect information from their students before teaching their SOE unit (pretests) and after teaching the unit (posttests).

Instrumentation

Five instruments were developed to measure the dependent variables and to record personal and situational information from the students and teachers. Four were designed to be completed by students under the direction of their vocational agriculture teachers, and one was used to collect data from the teachers involved in the research. The development of the instruments is described in the following paragraphs. Other procedures--scoring, item analysis, reliability--are outlined in the analysis section. A copy of each instrument is included in Appendix D.

Student instruments

Student Data Questionnaire This instrument was administered before the experiment and was used to collect student data related to selecting and planning SOE programs in vocational agriculture. The 15 questions elicited educational and occupational plans as well as situational data from each student.

Supervised Occupational Experience Knowledge Inventory An objective test of 30 multiple-choice items with four alternatives each was used to assess each student's knowledge of supervised occupational experience. The test was administered as a pretest and a posttest, with the items and the alternatives for each item randomly arranged for each administration. The individual items were based on the behavioral objectives stated in the teacher's instructional packet. Items were written by individual project members; the entire project team then evaluated each item for content validity. To insure face validity, the test was typed and reproduced similar in design to a common teacher-made test. Test reliability was measured and item analysis done as part of the experiment. Therefore, these procedures are described in the section on analysis of data, and the findings are reported in Chapter IV.

Supervised Occupational Experience Attitude Scale To measure each student's attitude toward vocational agriculture supervised occupational experience programs, an SOE attitude scale was developed. This scale consisted of 38 statements written by the project team. Based on a review of literature and objectives from the affective domain in the instructional materials, each statement was designed to elicit a response

of agreement or disagreement from the students. Students were asked to express their opinions about each statement using the following scale:

1	2	3	4	5	6	7	8	9	10	11
strongly disagree			slightly disagree		unde- cided	slightly agree				strongly agree

The items on the scale were arranged randomly and independently for the pretest and the posttest. Again, reproduction and format resembled a teacher-constructed measure. As part of the analysis of data, item- and factor-analytic techniques were employed. Reliability was also measured from data collected in the experiment.

Supervised Occupational Experience Program Planning Inventory

This 15 item inventory measured the degree to which students had actually selected and planned their individual SOE programs at the conclusion of the instructional unit. Students simply responded to the questions by answering "yes" or "no" to indicate whether or not they had completed activities deemed important in the planning of SOE programs.

To select items for this instrument, the project team members formulated possible "indicators" that beginning vocational agriculture students had selected and planned their SOE programs. These "indicators" --which were statements describing an SOE planning activity--were then presented to staff members in the Agricultural Education Department at Iowa State University. They were instructed to indicate the "weight" or degree of importance they would attach to each of the items as an indicator of good SOE program planning by a student. The staff members

responded to each statement on a scale of 1 to 9, with 1 representing "little or no importance" in indicating good SOE planning and 9 representing "much importance". This initial validation process reduced the number of indicators to 15. (Two items from the original list were eliminated because the staff disagreed on their importance in SOE planning. The standard deviations of the two items eliminated were above 2.0; all others were below 2.0.)

Then, a jury of individuals considered by the project team to be knowledgeable of SOE programs and the process of selecting and planning them was asked to rate each item as an indicator of good planning. The jury consisted of the following persons:

Mr. Gerald Barton, Consultant, Agricultural Education, Iowa Department of Public Instruction

Dr. Harold Binkley, Professor and Chairman, Department of Vocational Education, University of Kentucky, Lexington

Dr. Martin McMillion, Associate Professor, Agricultural Education Program, Virginia Polytechnic Institute and State University, Blacksburg

Mr. Wayne Nattress, Vocational Agriculture Instructor, Buffalo Center, Iowa, Community High School

Mr. Clifford VanBerkum, Vocational Agriculture Instructor, Swea City, Iowa, Community High School

The jury members responded to the statements on the same scale that was used earlier with departmental staff members and is described above.

A mean rating for each of the 15 statements was calculated by averaging the judges' responses, and the standard deviations were examined to determine the extent of agreement among the jurists. Because the jury members agreed on the weights (item standard deviations

were below 2.0), all 15 items were used in developing the planning inventory. The items retained for the final instrument and their weighted values (mean ratings) appear in Appendix E. Questions requiring a yes or no response from students in the experiment were written to correspond to these 15 indicators. Finally, reliability of the SOE Program Planning Inventory was computed from data collected in the experiment. As with the knowledge inventory and attitude scales, the procedures used are described in the analysis of data; results are presented in the findings.

Teacher instrument

Teacher questionnaire A 30-item questionnaire was designed to assess situational variables relative to the SOE instructional unit. Other questions were asked to gather teacher personal data, school and vocational agriculture department data, and other data associated with the development of student SOE programs. This instrument was completed by each vocational agriculture teacher at the conclusion of the experiment.

Collection of Data

Each teacher in the experimental group was given the pretest instruments during the inservice training session. Also, projected completion dates and the number of students for each teacher were recorded at this session. The researcher used this information to mail posttest instruments in correct quantities and at the proper time.

Teachers in the control group were contacted by the researcher after they had agreed to participate in the study. A letter was mailed to them requesting the number of students in their beginning vocational agriculture classes and the approximate dates between which they would teach their SOE units. Then, using this information, the investigator mailed them the pretest instruments and directions for their administration shortly before teaching the unit. Similarly, shortly before the reported completion date, mailings were made with the posttest instruments and directions. (See Appendix A.)

In addition to completing the instruments used for data collection, each teacher and each student was asked to sign an informed consent form (see Appendix C), allowing the researcher to use the data. Because the students were minors, parental signatures giving consent were also necessary.

These procedures resulted in usable data from 33 of the 40 schools--17 schools in the experimental group and 16 schools in the control group (see Appendix B). Various factors contributed to this less than 100 percent response. Among these were loss of materials in the mail, late arrival of materials, and failure to get informed consent signatures. This experimental mortality may be considered a threat to internal validity; however, informal assessments indicated that this loss of respondents from the comparison groups was random.

Analysis of Data

The data gathered from the teachers and students were coded and recorded on IBM cards, and analyses were done using computer facilities at the Computation Center, Iowa State University. The following description of analysis procedures is an overview of statistical treatment of the data. Two systems of computer programs available to many researchers served as the bases for selecting statistical routines: the Statistical Package for the Social Sciences (SPSS) (Nie et al., 1975) and the Statistical Analysis System (SAS) (Barr et al., 1976).

Data modification procedures

After the data were punched on IBM cards, procedures were employed to modify and reduce the data so that the objectives of the study could be accomplished. For example, data were collected from each individual student. However, since schools (or classes) were randomly chosen and assigned to treatment groups, the intact class served as the experimental unit to evaluate the treatment effects. Following is an explanation of the data modification procedures used.

Modification of SOE Knowledge Inventory data Responses from students for each item on the inventory were recorded according to the alternative chosen by the student. So, for each item, a value of "1", "2", "3", or "4" was punched on an IBM card. To compute a score for each student, the correct alternative was recoded as a "1", an incorrect alternative was assigned a "0". amd the correct responses ("1's") were counted. This resulted in a possible score of 30 for the knowledge

inventory if all items were answered correctly. Then, to convert all scores to a percentage basis, the number of correct responses was multiplied by 3.33; now, the highest possible score was 100. Class means were computed to be used for the analysis of treatment effects.

Modification of SOE Attitude Scale data As reported in the instrumentation section, students responded to 38 statements about SOE on a scale of "1" to "11". These values were then transformed to a "0" to "16" scale as follows:

Response values	1	2	3	4	5	6	7	8	9	10	11
Transformed values	0	3	5	6	7	8	9	10	11	13	16

This method of scoring "spreads out" the ends of the original scale. It assumes that there is a greater difference between a respondent who rates an item "1" and a respondent who rates an item "2" than there is between two respondents, one of whom rated an item "5" and the other who assigned an item "6". The certainty method (Warren, Klonglan, and Sabri, 1969) was used as a basis for this data transformation procedure. For initial analysis purposes, a total SOE Attitude Scale score was derived by (1) summing the transformed values for each student's responses to the 38 items, and (2) dividing the summated score by 6.08. Again, this resulted in a possible "score" of 100: 38 x 16 = 608 ÷ 6.08 = 100. Finally, class means were computed and used as the experimental unit observations.

Modification of SOE Program Planning Inventory data Students responded with simply "yes" or "no" to each of the 15 questions which comprised the inventory. The "yes" response was coded as "1" while

"no" was assigned "0" on the IBM cards. These punched values were then multiplied by the assigned weight to each question. (See Appendix E.) If a student answered yes to every question, his score was 96. Once more, to convert to a high possible score of 100, each student's score was divided by 0.96 (96 ÷ 0.96 = 100). Students' scores on the SOE Program Planning Inventory were averaged by class to yield class means. These means served as experimental unit scores for analysis of treatment effects.

Modification of data from teacher and student questionnaire Individual student responses were averaged to give class means. This was performed only for interval-level variables since categorical variables do not lend themselves to means as measures of central tendency. Rather, values for categorical variables served to explain and describe the sampling units (students). Because only one teacher existed for each class, his responses represented data from the experimental unit. Therefore, no modification was needed before entering his data into the statistical analyses.

Descriptive analyses

Analysis of background variables SPSS subprogram CROSSTABS was employed to construct contingency tables for selected student, teacher, and school characteristics and students' occupational and educational plans. This procedure was used to describe categorical variables. Similarly, subprogram CONDESCRIPTIVE was utilized to summarize variables measured on an interval scale. Calculated by this

procedure were means and standard deviations of selected student, teacher, and school variables.

Analyses of dependent variable data-gathering instruments The SOE Knowledge Inventory was analyzed for consistency using SPSS subprogram RELIABILITY (Specht, ca. 1975). A measure called reliability coefficient alpha was computed for both pretest and posttest responses. Also computed were item-analytic measures--average item difficulty and average item discriminating power.

To examine the SOE Attitude Scale, the reliability cofficient alpha was computed for the entire 38 item scale. To investigate the unidimensionality of the 38-item scale, factor analysis using SPSS subprogram FACTOR was performed. The particular method chosen was PA2-principal factoring with iteration.

> At present this is the most widely accepted factoring method. Those who have limited experience with factor analysis might do well to stay with this method (Nie et al., 1975, p. 480).

A modified attitude scale as suggested by the factor analysis was also examined to determine its reliability. Finally, variances of the individual items and item intercorrelations were computed to determine the feasibility for summing the items to give a total score.

The SOE Program Planning Inventory was appraised by computing reliability coefficient alpha. Two measures were made: (1) reliability of the "yes = 1, no = 0" response framework and (2) reliability of "yes = weighted value, no = 0" scoring framework.

The results of these analyses are reported in Chapter IV: Findings. They represent characteristics of the instruments as determined from data gathered in the experiment.

Inferential analyses

Chi square analyses were performed using a command from subprogram CROSSTABS. These analyses were done to measure the association between the treatment group to which a school was assigned and selected categorical background variables. In a similar manner, SPSS subprogram T-TEST analyzed several interval-level background variables to determine if they differed for the two treatment levels. Basically, these two procedures were used to establish the success of the random assignment of schools to treatment groups.

SPSS subprogram PEARSON CORR calculated Pearson product-moment coefficients of correlation for selected pairs of interval-level variables. Significant correlations were inferred from the procedure.

SAS procedure ANOVA was used to analyze the effects of treatment levels on both student knowledge of SOE (measured by the SOE Knowledge Inventory) and attitude toward SOE (from the SOE Attitude Scale). The statistical design used in these analyses was a two-factor experiment with one repeated measure (Winer, 1962). The model is represented symbolically by

$$Y_{ijk} = \mu + \alpha_i + \varepsilon_{ij} + \beta_k + (\alpha\beta)_{ik} + \delta_{ijk}$$

where

Y_{ijk} = class means (Pretest and posttest means were considered separate measures.).

μ = overall grand mean of the pretest and posttest means.

α = effect of the treatment group or level (disregarding pretest or posttest).

ε = random error for the whole plot (deviation of combined pretest and posttest class means from the overall treatment mean within each treatment level).

β = effect of the repeated measure (pretest versus posttest disregarding treatment group).

$\alpha\beta$ = interaction of the treatment group and the repeated measure.

δ = random error for the split plot (deviation of pretest and posttest class means from the combined pretest-posttest mean within each school or class).

i = 1, 2 for the treatment levels.

j = 1, 2. . .17 for schools or classes.

k = 1, 2 for the repeated measure (pretest or posttest).

This model permits (1) analysis of responses by treatment group, (2) analysis for difference between pretest and posttest responses, and (3) analysis to determine if the magnitude of change of responses from pretest to posttest differed by treatment group (the interaction of time and treatment level).

SPSS subprogram ONEWAY provided analysis of variance to determine differences between SOE program planning done by the control and experimental groups. The linear model used in this single classification analysis of variance was

$$Y_{ij} = \mu + \alpha_i + \varepsilon_{ij}$$

where

Y_{ij} = posttest class mean for the SOE Program Planning Inventory.

μ = overall mean of the SOE Program Planning Inventory.

α = effect of the treatment group or level.

ε = random error.

i = 1, 2 for the treatment levels.

j = 1, 2. . .17 for schools or classes.

Summary of Research Procedure

The study was conducted during fall semester, 1977, to evaluate the effectiveness of an instructional packet on SOE programs for beginning vocational agriculture students in Iowa. Effectiveness was assessed in terms of (1) student knowledge of SOE, (2) student attitude toward SOE, and (3) student planning of individual SOE programs. Two treatment levels were used: (1) teachers were provided the instructional packet and insevice education on its use (experimental group) and (2) teachers were not allowed access to the instructional packet (control group).

The pretest-posttest control group design was used in the study. Pretest measures of (1) student personal and situation variables, (2) student knowledge of SOE and (3) student attitude toward SOE were collected before the experimental instruction began. At the conclusion of this instruction, posttest instruments collected information concerning (1) student knowledge of SOE, (2) student attitude toward SOE, (3) student planning of their SOE programs, and (4) teacher personal, situational, and programmatic variables.

Teachers were randomly selected from a frame of experienced vocational agriculture teachers in Iowa, and they were randomly assigned to the control or experimental group. Actually, each experimental unit consisted of the teacher and his beginning vocational agriculture class.

Administration of data collecting instruments was done by the vocational agriculture teacher. The data were then statistically analyzed using computer facilities at Iowa State University.

CHAPTER IV.

FINDINGS AND DISCUSSION

The purpose of this study was to evaluate the effectiveness of an instructional packet on supervised occupational experiences programs for beginning vocational agriculture students in Iowa. To accomplish this purpose, vocational agriculture teachers and their beginning vocational agriculture classes were randomly chosen to participate in the research. Half were assigned to an experimental treatment group which used the instructional packet; the other half represented a control treatment group with traditional materials and methods used to learn about SOE programs. Data were collected from the two groups as follows: (1) personal and situational information from the students and teachers, (2) student knowledge of SOE, (3) student attitude toward SOE, and (4) student SOE planning. Results of analyses of the data generated by this investigation are presented in this chapter.

Results of data analyses are presented in four sections: (1) descriptions and analyses of personal and situational characteristics of the vocational agriculture students, teachers, and schools participating in the study; (2) descriptive analyses of dependent variable data-collection instruments; (3) correlational analyses of variables measured on an interval scale; and (4) tests of hypotheses comparing results of the experiment for the experimental and control treatment groups.

Student and Teacher Characteristics

Random selection of teachers and their classes and their random assignments to either the experimental or control group were done in an attempt to insure both representation of the population and similarity between groups. To show the results of variables expressed as nominal measurements, a series of tables are presented. Chi square statistics were calculated to determine if relationships existed between the treatment group and the criterion variables. Because these variables were not influenced by the treatment itself, experimental units were considered to be students rather than classes. In other words, with all the students in a beginning class measured rather than a random sampling, the school may be considered a cluster. All students within the cluster were sampled.

More than three-fourths of the students enrolled in the beginning vocational agriculture classes involved in the study lived on farms. The data in Table 1 show that another 14 percent of the students lived in towns, while the remaining 10 percent lived in rural areas but not on farms. These data differ somewhat from those reported by Williams (1977a). He found that 85 percent of the students in his random sample were from the farm while the remaining 15 percent lived in town or on a small acreage. Data reported by Byler (1976) from a random sample of Iowa vocational agriculture students were intermediate; his data revealed 81 percent farm residents and 19 percent non-farm residents.

A statistically significant relationship existed between the place of residence and the treatment group. This suggests that the students in the two groups were not homogeneous with reference to residence even with random selection and assignment. McMillion and Auville (1976) found, however, that the student's place of residence was not related to a score measuring the success of his or her SOE program. Nevertheless, further investigation is warranted.

Table 1. Residence of students by treatment group

Place of residence	Treatment group				Total	
	Experimental		Control			
	N	%	N	%	N	%
In town	21	5.4	32	8.3	53	13.7
Rural area, not on farm	17	4.4	21	5.4	38	9.8
On a farm	169	43.7	121	32.8	296	76.5
Total	207	53.5	180	46.5	398	100.0
					Chi-square = 6.81*	

*Significant at .05.

Another situational variable closely associated with the students' places of residence is their fathers' or guardians' occupations. As expected, a majority (61 percent) of the fathers or guardians were farmers (Table 2). Eleven percent were involved in agribusiness or other agricultural-related occupations, while about 28 percent held

non-agriculture jobs. Again, a significant relationship was found between experimental group and occupation. One might expect this since the place of residence would surely be related to the parent's occupation.

Table 2. Occupation of father or guardian by treatment group

Occupation of father or guardian	Treatment group				Total	
	Experimental		Control			
	N	%	N	%	N	%
Farmer	136	36.0	96	25.4	232	61.4
Other agriculture	23	6.1	17	4.5	40	10.6
Non-agriculture	45	11.9	61	16.1	106	28.0
Total	204	54.0	174	46.0	378	100.0
					Chi-square = 7.8*	

*Significant at .05.

A factor that was weakly correlated with the success of a student's SOE program (as determined by McMillion and Auville, 1976) was whether or not the student's parent had received vocational agriculture training in high school. Table 3 presents the data for the relationship between treatment group and whether the student's father had been enrolled in vocational agriculture as a high school student. Once more, a significant relationship was revealed; also, one would suspect that the three criterion variables--places of residence,

father's occupation, and father's formal vocational agriculture training--are related.

Table 3. Father's enrollment in vocational agriculture by treatment group

Was your father in vocational agriculture?	Treatment group				Total	
	Experimental		Control			
	N	%	N	%	N	%
Yes	86	22.9	53	14.1	139	37.0
No	115	30.6	122	32.4	237	63.0
Total	201	53.5	175	46.5	376	100.0
					Chi-square = 5.7*	

*Significant at .05.

Finally, the factor of whether a student had brothers or sisters who had been or were presently enrolled in vocational agriculture was investigated. No significant relationship existed between the treatment groups and sibling enrollment in vocational agriculture (Table 4).

The above contingency tables indicate a relationship between the treatment group to which a student was assigned and selected student situational variables. To investigate this relationship further and to describe this sample of beginning vocational agriculture students in Iowa, other student situational variables were examined. Because these variables were measured on an interval scale, means and standard deviations were used to describe them; similarly, the t-test

Table 4. Sibling enrollment in vocational agriculture by treatment group

Did you or have you had siblings in vo-ag?	Treatment group				Total	
	Experimental		Control			
	N	%	N	%	N	%
Yes	93	24.3	63	16.4	156	40.7
No	112	29.2	115	30.0	227	59.3
Total	205	53.5	178	46.5	383	100.0
					Chi-square = 3.5 ns	

was employed as a technique to infer whether population parameters for these variables differ.

Four student situational variables were measured on an interval scale: (1) the total acres which the family owns and/or rents, (2) the crop acres which the family farms, (3) the animal units which the family owns, and (4) the percentage of the family's income derived from farming. Number of respondents, means, standard errors, and the t-values to test for differences between the two treatment groups are shown in Table 5.

Because none of the t-values showed statistically significant differences between the two treatment groups, the researcher concluded that, for these variables, the groups were homogeneous. In a study reported by Kahler (1970), the total acres, crop acres, and animal units

Table 5. Means, standard errors, number of respondents, and t-values for student situational variables by treatment group

Student situational variables	Treatment group: Experimental		Treatment group: Control		T-value
	Mean / S.D.	N	Mean / S.D.	N	
Total acres	371 / 328	202	328 / 415	171	1.09 ns
Crop acres	305 / 282	198	309 / 444	168	-0.10 ns
Animal units	297 / 537	199	334 / 961	173	-0.44 ns
Income from farming (%)	64.2 / 39	194	56.5 / 43	161	1.78 ns

were useful in predicting students' scores on tests of student knowledge of selected instructional areas in vocational agriculture. The percentage of the family's total income obtained from farming was correlated with the success of a student's SOE program, according to McMillion and Auville (1976).

Finding that no statistically significant differences existed for these variables between the experimental and control treatment group suggests that the groups were similar and may be expected to react similarly to instruction on SOE. Notably, the values for total acres, crop acres, and animal units are considerably greater than those reported by Kahler (1970). His values were approximately 250 total

acres, 200 crop acres, and 100 animal units. These changes certainly reflect the growth of Iowa farms in the past 10 years.

Along with situational variables which may influence the student's knowledge, attitudes, and performance are personal characteristics. In many educational experiments involving testing of student abilities, previous grades and extracurricular involvement have been significant predictors of performance. The data in Table 6 show an analysis of grades normally achieved by this sample of students. An almost normal distribution of grades revealed no association between treatment group and grades normally achieved.

Table 6. Student grades normally achieved by treatment group

Grades	Treatment group				Total	
	Experimental		Control			
	N	%	N	%	N	%
Mostly A's	13	3.4	11	2.8	24	6.2
Mostly B's	94	24.4	84	21.8	178	46.1
Mostly C's	92	23.8	82	21.2	174	45.1
Mostly D's and F's	7	1.8	3	0.8	10	2.6
Total	206	53.4	180	46.6	386	100.0
					Chi-square = 1.3 ns	

Similarly, the number of extracurricular activities in which students participated was somewhat normally distributed; and, once

Table 7. Number of extracurricular activities by treatment group

Number of activities	Treatment group				Total	
	Experimental		Control			
	N	%	N	%	N	%
0	32	8.4	30	7.8	62	16.2
1	67	17.5	67	17.5	134	35.0
2	64	16.7	54	14.1	118	30.8
3	36	9.4	20	5.2	56	14.6
4 - 5	8	2.1	5	1.3	13	3.4
Total	207	54.0	176	46.0	383	100.0
					Chi-square = 3.7 ns	

again, no relationships were found between treatment group and number of activities (Table 7). To identify the extracurricular involvement of the students more fully, Table 8 is presented. These data depict the kinds of activities in which students in the two treatment groups were involved. So, over two-thirds of the students in each group had participated in athletics while about one-third were involved in 4-H club or music activities.

The final personal variable investigated was whether or not the student was or intended to become a member of the FFA. Table 9 presents the results of this observation. A large majority of the students (345 of 386) either were FFA members or intended to become members.

Table 8. Number and percentages of students' extracurricular involvement by treatment group

Activity[a]	Treatment group				Total	
	Experimental		Control			
	N	%[b]	N	%	N	%
Athletics	144	37.2	125	32.3	269	69.5
4-H	73	18.9	61	15.8	134	34.6
Music	71	18.3	52	13.4	123	31.8
Student government	14	3.6	14	3.6	28	7.2
Other activities	32	8.3	5	1.3	37	9.6

[a]A chi-square test was done on each activity by treatment group. The only statistically significant relationship revealed was "other activities" by treatment group.

[b]Percentage of total number of observations (N = 387). These values are not additive as students may have participated in more than one of the activities.

Table 9. Membership in FFA by treatment group

FFA member?	Treatment group				Total	
	Experimental		Control			
	N	%	N	%	N	%
Yes	188	48.7	157	40.7	345	89.4
No	18	4.7	23	6.0	41	10.6
Total	206	53.4	180	46.6	386	100.0

Chi-square = 1.3 ns

To complete the description and analyses of students participating in the study, presented below are personal plans of the students. First, the occupational plans of the students are shown in Table 10. Over one-half of the students plan to enter production agriculture, either as farmers or farm employees. About 14 percent hope to get jobs in off-farm agricultural occupations, while 21 percent do not anticipate taking an agricultural job. Surprisingly, only 11 percent of these beginning vocational agriculture students were undecided on their occupational plans. Chi-square analysis detected no relationship between students' occupational plans and the treatment groups.

Table 10. Occupational plans by treatment group

Occupational area	Treatment group				Total	
	Experimental		Control			
	N	%	N	%	N	%
Production agriculture	107	28.8	94	25.3	201	54.0
Off-farm agriculture	30	8.1	21	5.6	51	13.7
Non-agriculture	38	10.2	40	10.8	78	21.0
Undecided	27	7.3	15	4.0	42	11.3
Total	202	54.3	170	45.7	372	100.0
					Chi-square = 3.11 ns	

These data agree with other recent studies which analyzed the occupational plans of students enrolled in vocational agriculture

in Iowa. Williams (1977a) reported that 48 percent of the 175 students in his sample planned to farm, 13 percent chose off-farm agribusiness, and 39 percent planned to seek non-agricultural occupations. Byler and Kaas (1976) reported in a study of over 600 junior and senior Iowa high school vocational agriculture students these data: 54 percent of the students planned to enter farming occupations; 18 percent, off-farm agricultural occupations; and 28 percent, non-agricultural occupations.

Students were asked to indicate their immediate plans after completing high school The data in Table 11 examine the results of this question. Both groups were divided fairly evenly among attending a vocational school or community college, attending a four-year college or university, becoming a self-employed worker, or getting a full-time job. Over one-half of the students planned no further formal education beyond high school. A non-significant chi-square value of 6.6 fails to indicate a relationship between students' "immediate plans" and the treatment group.

Again, these data reflect Williams' findings. In his sample, a total of 56 percent (as compared to 51 percent of the students sampled in this study) of the senior students planned to become employed or self-employed and not attend college upon graduation from high school. One-fourth (versus 23 percent) planned to attend an area vocational school or community college. Finally, he reported that 19 percent planned to attend a four-year college or university while this study reveals 26 percent who plan to attend a four-year institution. A similar

Table 11. Students' immediate plans after completing high school by treatment group

Immediate plans	Treatment group				Total	
	Experimental		Control			
	N	%	N	%	N	%
Attend a vocational school or community college	46	12.2	41	10.9	87	23.1
Attend a four-year college or university	55	14.6	44	11.7	99	26.3
Work for yourself (self-employed)	59	15.6	37	9.8	96	25.5
Get a full-time job (including military service)	41	10.9	54	14.3	95	25.2
Total	201	53.3	176	46.7	377	100.0
					Chi-square = 6.6 ns	

study by Byler (1975) revealed data consistent with these findings. He found that 56 percent of the 591 students in his sample planned to get a job, 26 percent planned to attend an area school, and 18 percent hoped to attend a four-year college or university.

The data from this study indicate that the two treatment groups were homogeneous on most of the student variables measured--total acres, crop acres and animal units on their home farms, percentage of income from farming, grades normally received, extracurricular involvement, FFA membership, and occupational and educational plans.

Similarly, these data agree with the findings of several earlier research efforts that studied situational and personal characteristics of Iowa vocational agriculture students.

Teacher and School Characteristics

Personal characteristics of the vocational agriculture teachers and the school situations in which they teach and students learn may affect the teaching-learning process. The following series of tables and discussion present an overview of selected variables which may influence student achievement. Numbers and percentages are given to describe these characteristics; inferential techniques (chi-square and t-test) are used to test for differences between the control and experimental treatment groups.

Background data on teachers in the study include answers to the following questions: (1) Where is your "home" in relation to the location of your present job? (2) Did you receive vocational agriculture training in high school? (3) Did you complete a university course dealing with supervised occupational experience? (4) What is the highest degree you have attained? (5) What kind of teaching certificate do you hold? (6) How many years have you taught? (7) How many years have you taught in your present position? (8) What is your age? (9) How many years of farm experience have you had? (10) How many years of agricultural business experience have you had?

The vocational agriculture teacher's origin (childhood home) influenced the success of students' supervised farming programs according

to McMillion and Auville (1976). To describe the origin of teachers sampled in this study, data in Table 12 are presented. They show that most of the teachers were native to Iowa but were not teaching in the same area in which they were reared. Three-fourths of the teachers received training in vocational agriculture as high school students. Then, during their college careers, almost two-thirds (64 percent) completed a course that focused on supervised occupational experience programs for vocational agriculture students. Exactly two-thirds of the teachers had earned bachelor of science degrees, while the remaining one-third held master's degrees. These same percentages of teachers held professional teaching certificates (33.3 percent) or permanent professional certificates (66.7 percent). Chi square values were computed on each of these five sets of categorical variables; all were non-significant statistically.

The assessments reported above indicate that the two treatment groups were fairly homogeneous with respect to the background variables measured. To describe the sample and compare the groups more fully, the data in Table 13 depict "background" variables measured on an interval scale. T-tests were employed to test for differences between the means of the two treatment groups.

Using the overall means for the five variables, the profile for an "average" teacher was as follows: He (all sampled teachers were male) was 32.5 years old, had taught for a total of 9.1 years with 7.7 of these years in his present position, and had 12.9 years of farm

Table 12. Selected background characteristics of vocational agriculture teachers by treatment group

Background variable	Treatment group				Total	
	Experimental		Control			
	N	%	N	%	N	%
Origin						
Out-of-state	3	9.1	2	6.1	5	15.2
In-state, different area	11	33.3	10	30.3	21	63.6
Same or neighboring county	3	9.1	4	12.1	7	21.2
	17	51.5	16	48.5	33	100.0
				Chi-square = 0.35 ns		
Vo-ag in high school?						
Yes	14	42.4	11	33.3	25	75.8
No	3	9.1	5	15.2	8	24.2
	17	51.5	16	48.5	33	100.0
				Chi-square = 0.25 ns		
College course on SOE?						
Yes	12	36.4	9	27.3	21	63.6
No	5	15.2	7	21.2	12	36.4
	17	51.5	16	48.5	33	100.0
				Chi-square = 0.24 ns		
Highest degree earned						
Bachelor of Science	13	39.4	9	27.3	22	66.7
Master of Science	4	12.1	7	48.5	11	33.3
	17	51.5	16	48.5	33	100.0
				Chi-square = 0.74 ns		
Type of teaching certificate held						
Professional	13	39.4	9	27.3	22	66.7
Permanent professional	4	12.1	7	21.2	11	33.3
	17	51.5	16	48.5	33	100.0
				Chi-square = 0.74 ns		

experience and .63 of a year of off-farm agricultural business experience. Kahler (1970) reported values of 11.7 years teaching tenure and 9.4 years teaching in their present position. Apparently, teacher turn-over rate has increased in the past eight years. The t-test failed to detect any significant differences between the two treatment groups for the background variables measured in this study. Based on these teacher variables, the two groups of teachers were similar.

Table 13. Means, standard deviations, and t-test between treatment groups for selected teacher background variables

Background variable	Treatment group				T-value
	Experimental		Control		
	Mean S.D.	N	Mean S.D.	N	
Age	32.2 9.63	17	33.2 10.86	16	-0.28 ns
Total years teaching experience	9.12 8.49	17	9.13 9.20	16	-0.01 ns
Years in present position	7.65 7.63	17	7.81 8.84	16	-0.06 ns
Years farming experience	14.18 9.13	17	11.56 6.43	16	0.96 ns
Years agricultural business experience	1.00 1.51	15	0.27 0.59	15	1.75 ns

The background variables actually formed a kind of situational variable because all have some effect on the educational program

available to the student. Other situational variables, moreover, contribute to (or detract from) the quality of education in vocational agriculture. The data in Table 14 describe further the "situation" or environment in which the teacher and student interacted. Variables included in this table were chosen from past studies that researched factors affecting students' SOE programs. As expected with random assignment of experimental units to treatment groups, none of the means showed statistically significant differences between the two groups when tested by the t-statistic.

Values for some of the variables were compared with those reported by Kahler (1970). He found the average class size to be about 13 students and a departmental enrollment of 52 pupils (compared to 12.5 and 56 students, respectively). Surprisingly, then, these data do not support a belief held by some Iowa agricultural educators that class sizes and departmental enrollments are increasing.

The final situational variables studied reveal the teachers' departmental and school duties (in addition to teaching high school vocational agriculture classes) and their part-time occupational involvement (Table 15). All 33 teachers served as FFA advisors and assisted with local and/or state fairs. On the other hand, only 15.2 percent had FFA alumni associations while one-third of the teachers had organized day-class advisory councils. Each of the 17 teachers in the experimental treatment group conducted some kind of adult agricultural education program; 14 of the 16 control treatment group teachers had adult programs.

Table 14. Means, standard deviations, and t-test for teacher and school situational variables by treatment group

Situational variable	Treatment group: Experimental Mean / S.D.	N	Treatment group: Control Mean / S.D.	N	T-value
Number of classes taught	4.94 / .83	17	4.56 / .89	16	1.77 ns
Number of class preparations	4.59 / .87	17	4.50 / .97	16	0.28 ns
Number of SOE visits normally made	2.65 / 1.27	17	2.81 / 1.38	16	-0.49 ns
Average class size	12.8 / 3.13	17	12.1 / 4.02	16	0.56 ns
Departmental enrollment	60.4 / 18.6	17	51.6 / 18.3	16	1.38 ns
High school enrollment	326 / 198	17	368 / 293	16	-0.49 ns
Hours of adult instruction	21.1 / 10.0	17	17.1 / 9.0	16	1.21 ns
Average distance to students' homes (miles)	8.12 / 3.62	17	7.38 / 3.88	16	0.57 ns
Distance to teacher's home	3.29 / 3.70	17	3.81 / 5.06	16	-0.34 ns
Percentage of vo-ag course grade dependent on SOE program	24.6 / 19.5	17	26.9 / 30.7	16	-0.26 ns
Hours normally spent teaching SOE in beginning vo-ag class	11.5 / 6.2	17	14.3 / 10.0	16	-0.96 ns

For students who have insufficient opportunities at home to conduct SOE programs, schools often provide school facilities. Over half of the schools in each group made facilities available for student use. The most popular type of school facility was a school farm or land laboratory. Other kinds of facilities--greenhouses, animal facilities, and enlarged agricultural mechanics laboratories--were less popular.

Other school duties for which the vocational agriculture teacher is responsible may affect the quality of instruction on SOE and, especially, the number of SOE visits. All of the 16 control group teachers and 15 of the 17 experimental group teachers reported they had at least one "other school duty". The popularity of these duties ranged from 26 teachers (13 in each treatment group) who supervised athletic events to nine teachers who served as class sponsors.

Finally, the teachers were asked to indicate their part-time occupational involvement. Nine experimental group and five control group teachers answered that they had part-time occupations. Farming accounted for 11 of the 16 part-time occupations, while agribusiness and other jobs comprised the remainder. Totally, 42.4 percent of the teachers indicated part-time occupational involvement.

A chi-square test of independence was performed for each of the "duty" categories in which expected cell frequency was sufficiently large (five or more) to justify statistically its use. All of the tests indicated that these duties or levels of involvement were independent of

Table 15. Departmental, school, and part-time occupational involvement of teachers by treatment group

Duty or involvement	Treatment group				Total	
	Experimental		Control			
	N	%	N	%	N	%
FFA advisor	17	51.5	16	48.5	33	100.0
FFA alumni association	2	6.1	3	9.1	5	15.2
Young farmer program	3	9.1	0	0.0	3	9.1
Adult education program	8	24.2	4	12.1	12	36.4
Combined program	6	18.2	10	30.3	16	48.5
	17	51.5	14	42.4	31	93.9
Day-class advisory council	5	15.2	6	18.2	11	33.3
Local and/or state fair duties	17	51.5	16	48.4	33	100.0
School facilities for SOE[a]	10	30.3	9	27.3	19	57.6
School farm (land lab)	9	27.3	8	24.2	17	51.5
Greenhouse	1	3.0	2	6.1	3	9.1
Animal facilities	0	0.0	2	6.1	2	6.1
Other (enlarged shop)	1	3.0	2	6.1	3	9.1
Other school duties[a]	15	45.5	16	48.5	31	93.9
Homeroom supervision	3	9.1	8	24.2	11	33.3
Study hall supervision	6	18.2	7	21.2	13	39.4
Lunchroom supervision	4	12.1	8	24.2	12	36.4
Class sponsor	3	9.1	6	18.2	9	27.3
Bus driver	7	21.2	3	9.1	10	30.3
Athletic event supervision	13	39.4	13	39.4	26	78.8
Part-time occupation[a]	9	27.3	5	15.2	14	42.4
Farming	7	21.2	4	12.1	11	33.3
Agribusiness	1	3.0	1	3.0	2	6.1
Other	2	6.1	1	3.0	3	9.1

[a]These categories are not additive. For example, some of the teachers reported as many as five "other school duties". Chi square tests were done on duty categories and treatment group. No significant associations were discovered.

the treatment groups to which the teachers were assigned. Apparently, the random assignment of teachers/schools to treatment groups successfully effected homogeneity between the groups for the teacher and school variables measured.

Summary of Analyses of Student, Teacher, and School Variables

In summary, the experimental and control treatment groups appeared similar. Student, teacher, and school variables were not different statistically for a large majority of the variables. Similarly, when the findings of this study were compared with earlier studies which measured the same variables, comparable results were obtained. One may infer that these subsamples represented the population from which they were randomly selected and that they were homogeneous.

Instrument Characteristics

Reliability coefficients were computed for the three instruments used to collect information on the dependent variables. In addition, item analysis of the SOE Knowledge Inventory was done; item- and factor-analytic procedures were employed to examine the SOE Attitude Scale. The following sections present the results of these procedures.

SOE Knowledge Inventory

Both the pretest and posttest knowledge inventory responses were analyzed. Shown in Table 16 are summary statistics which were calculated to appraise the inventory.

Table 16. Descriptive summary of SOE Knowledge Inventory

Characteristic	Pretest	Posttest
Mean score	57.8	68.8
Standard error of measurement	7.9	7.3
Reliability coefficient alpha	.776	.842
Mean item difficulty	.578	.688
Mean item discriminating power	.283	.298

So, on the average, students answered correctly 58 percent of the items on the pretest and 69 percent on the posttest. The reliability coefficients of .776 and .842 were good for a short (30-item), "teacher-made" test. Similarly, the item difficulty means (which actually are shown by mean scores) were reasonable: .578 and .688 for the pretest and posttest. The item discriminating power means were .283 and .298; individual item analysis indicated that all 30 items had positive values for discriminating power, and all were above .10 for both the pretest and the posttest. Individual item data for the analysis of the SOE Knowledge Inventory are presented in Appendix F.

SOE Attitude Scale

The measure of students' attitudes toward SOE was made with a 38-item attitude scale. Reliability coefficients (coefficient alpha) were computed on both the pre- and post-experiment administrations of this scale. The reliability coefficient for the pretest inventory was .937 while the posttest reliability was .957.

To examine the inventory more completely, factor analysis was performed separately on the pretest and posttest measures. This procedure (described previously) resulted in the discovery of one factor which accounted for about 85 percent of the total variability in each test administration when the number of factors in the analysis was limited to three. Apparently, the attitude scale was successful in measuring students' overall attitudes toward SOE. Closer examination of the factor analysis, however, revealed several low (below .35) factor loadings on the first factor and/or higher loadings on factors two and/or three than on factor one.

To determine whether dropping these "low-loading" items would improve the reliability of the scale, eight of the original 38 items were deleted to form a new modified attitude scale. Again, reliability coefficients were computed. The reliability coefficients were .935 and .955 for the modified pretest and modified posttest, respectively. These values were virtually identical to the original test reliability coefficients; nevertheless, a decision was made to use the original scale consisting of all 38 items. This decision was based on the following factors: (1) The modified attitude scale was no more reliable than the original scale; (2) since students had responded to the 38 items, the data were available; (3) responses to the 30 items included in the modified scale may have been influenced by the eight items that were deleted; (4) therefore, future administrations of the modified scale could not be compared directly to this administration; and (5) the researcher determined that the eight items had theoretical and empirical

bases for inclusion in a measure of beginning students' attitudes toward SOE in vocational agriculture.

The magnitude of the coefficients of reliability are evidence that the items in the scale were linearly related. Another condition appraised was whether the variances of the responses to the different items were homogeneous. For the 38 items, the maximum variance for any item was 18.8; the minimum variance was 8.0. An F-max test was performed to determine that the variances were homogeneous. Also, the relationship was found to be negative, though not statistically significant. These results satisfied one condition for scale additivity: that item variance must be homogeneous and independent of the means.

Finally, the intercorrelations among the items of the scale were inspected. Over three-fourths of the intercorrelation coefficients were between .30 and .50. This indicated that the intercorrelations were homogeneous. Furthermore, all item intercorrelations were positive; together, these two findings supported the procedure for computing a summated attitude score.

A summary of the results of the attitude scale analyses are presented in Table 17. Additionally, item analyses results are given in Appendix F.

SOE Program Planning Inventory

The SOE Program Planning Inventory was used to assess the "degree" to which students had selected and planned their individual SOE programs. It consisted of 15 questions which elicited "Yes" or "No" responses

Table 17. Summary of SOE Attitude Scale characteristics

Characteristic	Value
Pretest reliability (coefficient alpha)	0.937
Posttest reliability (coefficient alpha)	0.957
Modified pretest reliability	0.933
Modified posttest reliability	0.955
Range of item variances	8.0 to 18.8
Concentration of the intercorrelations among the items	77% were between .30 and .50.
Unidimensionality	85% of the variance was accounted for by Factor 1.

from the students. The "yes" response was coded with a "1" and later a weighted value, while the "no" response was assigned a "0". A total score for each student was then derived by summing the weighted values from "yes" responses and dividing this sum by a constant to give a possible score of 100. (These procedures were more fully described in the instrumentation section of Chapter III.)

To ascertain the internal consistency of this posttest, two reliability coefficients were computed. The first was obtained with values of 0 and 1 as responses; the second used values of 0 and the weighted values. For the 0-1 response framework, a reliability coefficient of .821 was yielded. Similarly, the 0-weighted value transformation produced a reliability of .818. These almost identical reliability coefficients both indicated that the test items were homogeneous. More detailed item analysis data are presented in Appendix F.

Summary of instrument characteristics

The three instruments used to collect data from the students--SOE Knowledge Inventory, SOE Attitude Scale, and SOE Program Planning Inventory--all had good internal consistency as measured by the reliability coefficient alpha. Further, analyses of the three composite measures revealed that the instruments were statistically acceptable.

The next step is to analyze these data to determine relationships among variables and causes and effects. For the remainder of the analyses, three of the dependent variables used to evaluate the instructional packet will be (1) SOE knowledge score, (2) SOE attitude score, and (3) SOE program planning score.

Pearson Product-Moment Coefficients of Correlation Between Pairs of Variables

The second part of the analyses of data collected in the study was the computation of Pearson product-moment coefficients of correlation between each pair of interval-level variables. A series of tables shows the correlation of (1) the independent variables, (2) the dependent variables, and (3) the independent and dependent variables for the data obtained from the 33 schools participating in the study. Class (school) means were used for all variables; therefore, the total number of respondents possible was 33.

Because the direction of the correlations was not hypothesized, a two-tailed test was performed with 31 degrees of freedom. A coefficient of correlation of .344 was significant at the 95 percent level of confidence, while .443 was significant at the 99 percent confidence

level for the number of cases in the study. The 28 variables measured on an interval scale yielded 378 correlations. Thirty were found to be significant at or beyond the 99 percent confidence level; only 27 correlations showed significance between the 95 percent and 99 percent levels of confidence. So, 321 correlations were not sufficiently large to indicate statistical significance at the 95 percent confidence level, which was the lowest acceptable level of confidence. The large number of correlations no doubt yielded several statistically significant but spurious correlations as well as those that can be explained theoretically.

Relations between independent variables

The following discussion deals with correlations between independent variables. Data in Table 18 show coefficients of correlation and indicate those which were statistically significant. Four of the independent variables grouped together to yield six highly significant correlations; they were total acres on a student's home farm, crop acres, on the farm, total animal units, and the percentage of income derived from farming. The positive correlations indicated that total acres, crop acres, animal units, and farming income were measuring a similar concept--a kind of "orientation to farming". One other variable was negatively correlated with the percentage of income from farming: High school enrollment decreased as farming income percentage increased.

Similarly, three teacher variables--age, total years teaching experience, and tenure in present position--were highly intercorrelated.

Older teachers had taught more years and longer in their present positions. Class size and total departmental enrollment were also positively correlated with teacher age and both measures of teaching tenure. That is, older, more experienced teachers tended to have larger classes and more students enrolled in vocational agriculture classes. Teacher age, too, was positively correlated with high school enrollment. So, older teachers taught in larger schools.

Measures of teaching load produced several highly significant coefficients of correlation. The number of classes and number of preparations were highly positively correlated, while the number of classes was correlated negatively with the distance to the teacher's home. Departmental enrollment, in a similar manner, increased as the number of classes, average class size and high school enrollment increased. The average class size was positively correlated with high school enrollment and distance to pupils' homes, too.

Two independent variables which examined SOE instruction and supervision normally provided by the vocational agriculture teacher--normal hours of SOE instruction and number of SOE visits--were correlated with several other independent variables although they were not correlated with each other. Positively correlated with "SOE teaching hours" were average class size, distance to the teacher's home, and the average distance to the students' homes. On the other hand, "SOE teaching hours" was negatively correlated with the number of classes and number of class preparations. Together, this meant that as average class size and distances to the teacher's and students' homes increased

Table 18. Coefficients of correlation between independent variables

Matrix variable	Description
1	Student grades
2	Acres on student's home farm
3	Crop acres on student's home farm
4	Animal units
5	Percentage of income from farming
6	Total years taught
7	Tenure in present position
8	Age
9	Farm experience
10	Ag business experience
11	Number of classes
12	Number of preparations
13	Average class size
14	Departmental enrollment
15	Hours adult instruction
16	High school enrollment
17	Distance to teacher's home
18	Distance to pupils' homes
19	SOE % of grade
20	Normal hours of SOE instruction in VoAg I
21	Normal number of SOE visits in VoAg I

*Significant at .05.

**Significant at .01.

1	2	3	4	5	6	7
.171						
.247	.867**					
.197	.485**	.451**				
.241	.658**	.565**	.468**			
-.051	-.075	.020	-.076	-.099		
-.006	-.080	.078	-.096	-.081	.968**	
-.085	-.014	.093	-.103	-.211	.933**	.896**
-.351*	.104	.054	.038	-.215	.196	.070
-.288	.060	-.135	-.108	-.011	.015	-.078
-.132	-.112	-.222	-.234	-.126	-.013	-.001
-.125	-.203	-.236	-.278	-.034	-.096	-.047
-.107	.230	.306	.159	-.037	.562**	.536**
-.268	.052	.112	-.168	-.083	.440*	.437**
-.095	-.136	-.157	-.026	-.127	.085	.078
-.148	-.152	-.096	-.116	-.444**	.217	.192
.097	.244	-.219	.280	.224	-.103	-.142
-.006	.121	-.004	.226	-.008	.250	.206
.182	-.162	-.150	.301	-.123	.087	.114
.048	-.012	.006	.322	.094	.111	.034
.137	-.087	.065	.400*	.059	.237	.250

Table 18. Continued

Matrix variable	8	9	10	11	12	13	14
1							
2							
3							
4							
5							
6							
7							
8							
9	.317						
10	.104	-.039					
11	-.088	-.258	.066				
12	-.202	-.441*	.077	.811**			
13	.622**	.303	-.039	.024	-.142		
14	.429*	.120	-.029	.491**	.214	.676**	
15	.046	.049	.243	.043	.132	.068	.118
16	.391*	.179	.088	.114	-.132	.554**	.365*
17	-.058	.086	-.017	-.345	-.197	.238	-.261
18	.329	.275	-.043	.030	-.034	.482**	.194
19	.066	-.103	-.028	.069	.024	.018	-.207
20	.171	.288	-.100	-.508**	-.404*	.347*	-.180
21	.202	.112	-.071	-.254	-.135	-.096	-.220

15	16	17	18	19	20	21
-.222						
-.208	.114					
.220	.319	.243				
-.093	.079	.176	-.062			
.127	.140	.437*	.543**	.059		
.014	-.203	-.166	.038	.105	.123	

and the number of classes and class preparations decreased, class hours spent on SOE instruction increased. The only variable correlated with the number of SOE visits normally provided by the teacher to beginning vocational agriculture students was animal units on students' farms. So, teachers normally visited students from farms with more animal units more frequently than students with fewer animal units.

Student grades were positively correlated with the teachers' years of farm experience. The number of class preparations, conversely, was negatively correlated with the teachers' farm experience. So, a teacher with more farm experience taught students who normally received higher grades, and he had fewer class preparations.

The 21 independent variables produced several statistically significant correlations. Some variables grouped together to reveal easily explained correlations. For example, teacher age, years teaching experience, and teaching tenure in present position all measure "teacher longevity". Similarly, a "farming orientation" score might be produced by total farm acres, crop acres, animal units, and percentage of income from farming. Other pairs of variables resulted in more "revealing" correlations. Interestingly, older teachers tended to have greater teaching loads as measured by larger classes and a larger departmental enrollment. In summary, 19 highly significant and 13 significant coefficients of correlation were produced by the independent variables.

Relations between dependent variables

The next part of the correlational analysis was an examination of the relationships among the seven dependent variables. Of the 21 coefficients of correlation shown in Table 19, seven were found to be statistically significant. Two of the dependent variables were considered "procedural"; that is, they actually were program procedures conducted by the vocational agriculture teacher. The correlation matrix reveals that none of the coefficients involving these two variables--labelled Y_3 and Y_4--was statistically significant.

Four of the five remaining criterion variables--knowledge pretest score, attitude pretest score, knowledge posttest score, and attitude posttest score--produced six significant correlation coefficients. The positive intercorrelations suggest that a class tended to score similarly on all of the four criterion tests. Coefficients were relatively large; they ranged in value from .387 for the correlation between the pretest knowledge score and the posttest attitude score to a highly significant coefficient of .715 for the correlation between the pretest and posttest attitude measures.

The final criterion variable--SOE planning score--was significantly related to only one other dependent variable, posttest attitude. This relationship was depicted by a correlation coefficient of .399. So, a student scoring high on the attitude posttest was likely to produce a high SOE planning score.

Table 19. Coefficients of correlation between dependent variables

Variable number[a]	Y_1	Y_2	Y_3	Y_4	Y_5	Y_6	Y_7
Y_1							
Y_2	.652**						
Y_3	.240	.186					
Y_4	-.280	.200	.111				
Y_5	.622**	.556**	-.049	.000			
Y_6	.387*	.715**	.151	.110	.606**		
Y_7	.124	.260	.161	.031	.282	.399*	

[a] Y_1 = knowledge pretest score.

Y_2 = attitude pretest score.

Y_3 = hours of SOE instruction to VoAg I, 1977.

Y_4 = number of SOE visits, 1977 VoAg I students.

Y_5 = knowledge posttest score.

Y_6 = Attitude posttest score.

Y_7 = SOE planning score.

*Significant at .05.

**Significant at .01.

Relations between independent variables and pretest scores

Scores received by students on the knowledge and attitude pretests were actually independent of the two treatment levels. Nevertheless, both were dependent on the 21 independent variables already discussed. Data shown in Table 20 present coefficients of correlation between these pretest scores and each of the independent variables. Surprisingly, only one of the variables had statistically significant correlation with each of the pretests. This variable--agricultural business experience of the vocational agriculture teacher--was negatively correlated with the knowledge pretest and the attitude pretest. Therefore, students whose teacher had little agricultural business experience tended to score higher on both pretests. One other variable--average distance to students' homes--was positively correlated with the attitude pretest score. So, as this distance increased, attitude scores increased. These data indicate that the independent variables which were not controllable by the researcher had little effect (singularly) upon either the students' initial knowledge about supervised occupational experience programs or their initial attitudes toward SOE.

Relations between independent and dependent variables

The final step in the correlational analyses of these data was to compute the relationships between independent variables (interval-level) and those dependent variables which were affected by the treatment levels. The coefficients of correlation reported in Table 21 disregard

Table 20. Coefficients of correlation between pretest scores and independent variables

Matrix variable	Description	Knowledge pretest	Attitude pretest
1	Student grades	.205	.123
2	Acres on student's home farm	-.160	.056
3	Crop acres on student's home farm	-.151	.007
4	Animal units	-.033	.107
5	Percentage of income from farming	.051	.286
6	Total years of teaching experience	-.148	.121
7	Tenure in present position	-.142	.133
8	Age	-.240	.041
9	Farm experience	.231	.194
10	Agricultural business experience	-.540**	-.440*
11	Number of classes taught	-.154	-.028
12	Number of class preparations	.006	-.122
13	Average class size	-.316	.093
14	Departmental enrollment	-.103	.086
15	Hours of adult instruction	.182	.272
16	High school enrollment	-.301	-.233
17	Distance to teacher's home	-.186	.125
18	Average distance to students' homes	.043	.406*
19	Percentage of grade dependent on SOE	-.173	-.298
20	Normal hours of SOE instruction in VoAg I	.027	.270
21	Normal number of SOE visits to VoAg I students	.107	.145

*Significant at .05.

**Significant at .01.

any treatment effect. They are simply zero-order correlation coefficients. The five dependent variables actually form two groups: (1) The hours of instruction on SOE and the number of SOE visits in 1977 represent "procedural" dependent variables. In other words, suggestions of hours of SOE instruction and SOE visits were given to the experimental treatment group during the teacher inservice meetings. The control group teachers, of course, were requested to teach about SOE and make SOE visits as they "normally" would. (2) Posttest knowledge score, posttest attitude score, and SOE planning score represent the dependent variables of major importance in evaluating the instructional packet. In Table 21, correlation coefficients of these five dependent variables with the 21 independent variables are presented.

Several independent variables were correlated with the hours of instruction on SOE in 1977. Predictably, the variable most highly correlated with this dependent variable was the normal hours of SOE instruction. Four other independent variables were positively correlated with SOE instruction in 1977--distance to teacher's home, average distance to students' homes, average class size, and animal units on students' home farms. Finally, a negative correlation with number of classes taught was revealed. Theoretical explanation of these correlations--except normal instructional hours on SOE--is difficult.

In a similar manner, the highest correlation with the number of SOE visits to beginning students in 1977 was produced by normal number

of visits. The only other independent variable related significantly with SOE visits in 1977 was farm experience of the vocational agriculture teacher. So, those teachers with more farm experience tended to make more SOE visits in 1977 to their beginning vocational agriculture students.

The next column of figures in Table 21 presents correlation coefficients of the knowledge posttest score with the independent variables. Three of these independent variables were significantly correlated with the knowledge posttest score; they were (1) percentage of income derived from farming; (2) agricultural business experience of the vocational agriculture teacher; and (3) high school enrollment. The first variable produced a positive correlation while the latter two were negatively correlated with the knowledge posttest score. The tendency, then, was for students to score higher on the knowledge posttest whose parents derived more of their income from farming, whose teacher had less agricultural business experience, and who attended high school with a smaller enrollment.

Attitude posttest scores were correlated with the following independent variables: (1) total years of teaching experience, (2) farm experience, (3) average distance to students' farms, and (4) the percentage of the students' vocational agriculture grades dependent upon SOE. The positive correlation coefficients of attitude posttest scores with the first three independent variables listed above meant that as years teaching and farm experience and average distance to students' farms increased, attitude posttest scores increased.

Conversely, these scores tended to decrease as the percentage of a students' grade dependent on SOE increased.

The final column of correlation coefficients depicts the relationship between the SOE planning score and the list of independent variables. Interestingly, none of these independent variables was significantly correlated with the SOE planning score.

These measures of relationships of 21 selected independent variables with five dependent variables produced a total of 15 statistically significant correlation coefficients. The two dependent variables identified as "procedural"--SOE instructional days in 1977 and SOE visits in 1977--were highly correlated with "normal" values for these variables. Although some independent variables were significantly correlated with one of the three dependent variables labelled as the more important criterion variable, no clear cut pattern existed. That is, the statistically significant correlation coefficients appeared to be rather randomly distributed among the independent variables. In no case was more than 16.5 percent of the variation in one of the three main criterion variables explained by a single independent variable ($r = -.406$). This indicates that the variation either must remain unexplained, be explained by the treatment group (or level), or by independent variables whose effects were not investigated.

Summary of correlational analyses

Zero order coefficients of correlation were computed between every pair of interval-level variables measured in the study. The matrix of

correlation coefficients of independent variables showed relatively few statistically significant relationships. In fact, most of the significant correlations were between variables which seemed to measure an underlying concept. For example, crop acres, total acres, animal units, and farming income all measure involvement in farming. Removing these easily explained relationships reduces the significant correlations to those which can be assumed to be spurious.

Dependent variables revealed significant relationships in seven of 21 correlation coefficients. All were positive correlations, indicating that students scored similarly on the five tests which were administered to them as criterion measures. The other two dependent variables represented program procedures followed by vocational agriculture teacher. These variables were not related to each other nor to any of the other dependent variables.

Two tables contained data to show the relationships between independent and dependent variables. Several of the independent variables explained significant amounts of variation in the criterion variables; nevertheless, in five of the seven dependent variables, less than 30 percent of the variation could be explained by any one of the selected independent variables. These results suggest that further investigation of the cause of variability in dependent variables is warranted.

Table 21. Coefficients of correlation between independent variables and dependent variables

Matrix variable	Description
1	Student grades
2	Acres on student's home farm
3	Crop acres on student's home farm
4	Animal units
5	Percentage of income from farming
6	Total years of teaching experience
7	Tenure in present position
8	Age
9	Farm experience
10	Agricultural business experience
11	Number of classes taught
12	Number of class preparations
13	Average class size
14	Departmental enrollment
15	Hours of adult instruction
16	High school enrollment
17	Distance to teacher's home
18	Average distance to students' homes
19	Percentage of grade dependent on SOE
20	Normal hours of SOE instruction in VoAg I
21	Normal number of SOE visits to VoAg I students

*Significant at .05.

**Significant at .01.

Hours SOE instruction	No. SOE visits	Knowledge Posttest	Attitude Posttest	SOE Planning Score
-.125	-.123	.156	-.011	-.015
.193	-.044	.100	.183	.100
.110	-.091	.062	.127	-.070
.366*	.181	.003	-.072	.202
.197	-.043	.400*	.312	.258
.005	-.021	.130	.372*	-.055
-.043	-.045	.096	.335	-.081
.065	.032	-.011	.300	-.214
.114	.406*	.073	.344*	.109
.128	-.063	-.362*	-.243	-.014
-.380*	-.228	-.041	.070	.097
-.296	-.130	.004	.042	.111
.377*	-.219	-.044	.308	.171
-.090	-.301	.158	.321	.092
.198	.092	.180	.196	.216
.137	-.223	-.348*	-.054	-.141
.529**	-.001	.050	.006	.197
.529**	.129	-.053	.405*	.101
.019	.075	-.230	-.406*	-.100
.741**	.179	.048	.111	.003
-.007	.670**	-.100	-.007	-.034

Procedural Dependent Variables Comparing Treatment Groups

Procedurally, the two treatment groups were similar with respect to hours spent on SOE instruction and average number of SOE visits per beginning student made by vocational agriculture teachers in 1977. Data in Table 22 reveal no significant differences for these two variables, although the means favor the experimental treatment group. Directions for use of the instructional packet suggested 15 hours of instruction on SOE and requested teachers to visit their beginning students.

Table 22. Means, standard deviations, and t-test between treatment groups for selected procedural variables

Procedural variable	Treatment group				T-value
	Experimental		Control		
	Mean S.D.	N	Mean S.D.	N	
Hours SOE instruction	17.82 5.73	17	14.94 9.24	16	1.09 ns
SOE visits per student	1.12 .36	17	1.00 .27	16	1.17 ns

Also suggested in the instructional packet was a parent-student-teacher meeting for selecting and planning SOE programs. Fourteen of the 17 experimental treatment group schools conducted these meetings. Only four of the schools ordinarily held meetings on SOE. Both in the

past and in 1977, three of the control group schools conducted parent-student-teacher meetings. These data indicated that most experimental group schools adhered to suggested procedures while the control treatment schools followed "normal" instructional procedures.

Tests of Hypotheses Comparing Treatment Groups

The final section of the data analysis involved tests of hypotheses comparing the SOE knowledge scores, the SOE attitude scores, and the SOE program planning scores of the experimental and control treatment groups. These tests of hypotheses served as the primary means of evaluating the instructional packet on SOE programs.

Both the SOE Knowledge Inventory and the SOE Attitude Scale were administered pre- and postexperiment, while the SOE Program Planning Inventory was given at the end of the experiment only. Following are presented the statistical design used, the hypotheses tested, and the results of the analysis of each of three dependent variable measures.

Comparison of SOE knowledge scores

Because the SOE Knowledge Inventory was administered as a pretest and a posttest, the statistical design used was a two-factor experiment with one repeated measure. The hypotheses to be tested involving SOE knowledge scores were:

Ho_1: There is no difference between the combined pretest-posttest SOE knowledge scores for the experimental and control treatment groups.

Ho_2: There is no difference between the pretest and posttest SOE knowledge scores (ignoring treatment groups).

Ho_3: There is no difference in the magnitude of change from the pretest to the posttest (SOE Knowledge Inventory) for the experimental and control treatment groups.

Presented in Table 23 are the mean values of the various groups implied in the null hypotheses. The means show that, combining the pretest and posttest results, the experimental treatment group performed slightly better than the control treatment group (64.60 versus 62.17). Most of this difference was accounted for by the posttest differences, because the experimental group averaged 71.10 while the control group scored 66.43 on the average. The two treatment groups began with almost identical SOE knowledge scores: The experimental group scored 57.69; the control group, 57.91. This indicated that the experimental schools improved their SOE knowledge scores on the knowledge inventory from the pretest to the posttest more than did the control schools.

The analysis of variance procedure was used to test the statistical significance of these differences in means. Results of the analysis of variance are shown in Table 24. The tabular F values with which the calculated F statistics were compared were:

$F_{1, 30, .10} = 2.88$ $F_{1, 31, .10} = 2.88$

$F_{1, 30, .05} = 4.17$ $F_{1, 31, .05} = 4.16$

$F_{1, 30, .01} = 7.56$ $F_{1, 31, .01} = 7.53$

Table 23. SOE knowledge score means and standard deviations by experimental and control; pretest and posttest; and experimental pretest, experimental posttest, control pretest, and control posttest

Group	Number of observations	SOE knowledge score Mean	S.D.
Experimental (combined pretest and posttest)	17	64.60	10.67
Control (combined pretest and posttest)	16	62.17	8.18
Pretest (combined treatment groups)	32	57.80	9.22
Posttest (combined treatment groups	33	68.83	9.58
Experimental group pretest	16	57.69	10.69
Experimental group posttest	17	71.10	10.64
Control group pretest	16	57.91	7.84
Control group posttest	16	66.43	8.49
Overall	65	63.40	9.42

(These same tabular values were used for the assessment of the SOE attitude scores and SOE program planning scores.)

The combined pretest and posttest analysis for the two groups failed to detect a significant difference. The small F value (.62) indicated that combining the two administrations of the inventory resulted in similar means for the two groups. So, the data supported the null hypothesis; it was not rejected. This comparison, however, was not of primary importance in assessing the SOE instructional packet.

Table 24. Analysis of two-factor experiment with repeated measures on one factor for the SOE knowledge score

Source of variation	Degrees of freedom	Sum of squares	Mean square	F-value
Treatment group	1	95.96	95.96	.62
Error a (schools within group)	31	4765.00	153.71	
Time (pretest vs. posttest)	1	1978.48	1978.48	77.88**
Treatment group x time	1	84.42	84.42	3.32[a]
Error b	30	762.11	25.40	
Total	64	7685.98		

[a]Significant at .10.

**Significant at .01.

More important was the change in scores from the pretest to the posttest. The second F value in Table 24 was significant beyond $p = .01$; the value of 77.88 indicated that pretest and posttest means (ignoring treatment group) differ highly significantly. So, the null hypothesis was rejected, and one can infer that the population means for pretest and posttest scores would be different.

The third hypothesis implied a test for interaction between treatment group and time of test administration. In other words, the research question was: Does the control treatment group show a different response from the pretest to the posttest than does the experimental treatment group? With $\alpha = .10$, the F value was statistically significant. So, the null hypothesis was rejected (if one is willing

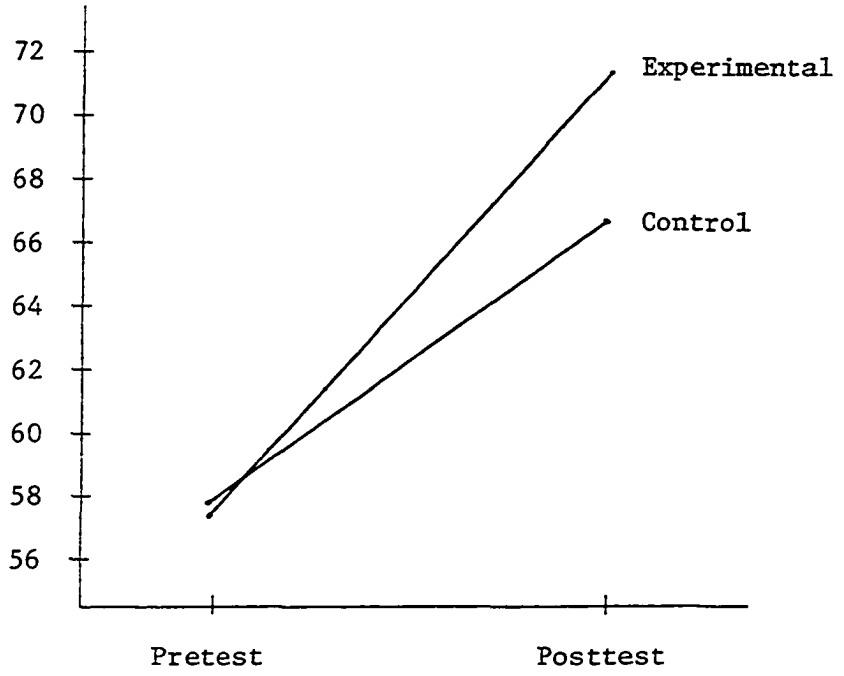

Figure 1. Interaction effect of treatment group and test administration on SOE knowledge score

to accept a .10 probability of a Type I error). The conclusion, then, was that interaction between treatment group and time of test administration (pretest versus posttest) did exist. Graphically, this interaction is shown in Figure 1.

Comparison of SOE attitude scores

The SOE attitude score served as the second criterion by which the instructional packet was evaluated. Again, the statistical design used was a two-factor experiment with one repeated measure. And, as with the knowledge measure, three null hypotheses were formulated:

Ho_4: There is no difference between the combined pretest-posttest SOE attitude scores for the experimental and control treatment groups.

Ho_5: There is no difference between the pretest and posttest SOE attitude scores (ignoring treatment group).

Ho_6: There is no difference in the magnitude of change from the pretest to the posttest (SOE Attitude Scale) for the experimental and control treatment groups.

To show the means implied in the null hypotheses, Table 25 is presented. First, the data showed that the experimental treatment group performed better than the control treatment group as shown by the pretest, posttest, and combined pretest-posttest means. The data also indicated that the groups scored better on the posttest than on the pretest administration. Finally, the experimental treatment group improved from the pretest to the posttest, while the control treatment group performed similarly on both administrations of the SOE Attitude Scale.

These differences in means were tested for statistical significance and the results of this analysis are shown in Table 26.

The first F value (2.63) was used to test for statistically significant differences between the experimental and control treatment groups. Because this value did not exceed the tabular value ($F_{1, 31, .10} = 2.88$), the null hypothesis was not rejected. The data failed to provide sufficient evidence to indicate that the combined pretest-posttest means were different.

Next, Ho_5 implied a test of the differences between the pretest and the posttest mean scores disregarding treatment group. This test

Table 25. SOE attitude score means and standard deviations by experimental and control; pretest and posttest; and experimental pretest, experimental posttest, control pretest, and control posttest

Group	Number of observations	SOE attitude score	
		Mean	S.D.
Experimental	17	70.11	7.73
Control	16	66.63	5.14
Pretest	33	67.50	6.90
Posttest	33	69.35	6.75
Experimental pretest	17	68.48	8.72
Experimental posttest	17	71.75	6.74
Control pretest	16	66.47	4.28
Control posttest	16	66.80	5.95
Overall	66	68.43	6.83

Table 26. Analysis of two-factor experiment with repeated measures on one factor for the SOE attitude score

Source of variation	Degrees of freedom	Sum of squares	Mean square	F-value
Treatment group	1	199.79	199.79	2.63
Error a (schools within group)	31	2357.01	76.03	
Time (pretest vs. posttest)	1	56.14	56.14	4.46*
Treatment group x time	1	35.45	35.45	2.82
Error b	31	389.91	12.58	
Total	65	3038.29		

*Significant at .05.

for "time" difference involved calculating the second F value in Table 26. Comparison of this value (4.46) with a tabular value of $\alpha = .05$ ($F_{1, 31, .05} = 4.16$) revealed statistical significance. The mean scores of the pretest and the posttest differed significantly; the null hypothesis was rejected.

Finally, the third F value was used to test for interaction effects between the treatment group and time of test administration. A value of 2.88 ($F_{1, 31, .10} = 2.88$) was necessary to indicate that interaction effects were present; the calculated F value of 2.82 was not sufficiently large to show a significant interaction. Nevertheless, this value did point out an indication of interaction. The means in Table 25 disclose an apparent difference in the magnitude of change (experimental group--68.48 to 71.75; control group--66.47 to 66.80); the analysis of variance, however, did not detect a statistical difference.

Comparison of SOE program planning score

The final criterion for evaluating the SOE instructional packet was the SOE program planning score. This measure was an indication of the actual performance by students in planning their own individual SOE programs. Therefore, the SOE Program Planning Inventory was administered only once--at the conclusion of the experiment.

The hypothesis postulated for evaluating the effects of treatment group on SOE program planning was:

Ho_7: There is no difference between the SOE program planning scores for the experimental and control treatment groups.

A single classification analysis of variance served as the statistical procedure by which this hypothesis was tested. Mean values for the two treatment groups and the overall experiment are shown in Table 27. The data revealed a large difference between the experimental and control treatment group means (71.16 and 52.39, respectively).

Table 27. SOE program planning score means and standard deviations by treatment group

Treatment group	Number of observations	SOE Program Planning score	
		Mean	S.D.
Experimental	17	71.16	11.94
Control	16	52.39	15.56
Overall	33	62.06	13.81

To test this evidence of difference between means, the ANOVA is presented in Table 28. The calculated F value of 15.22, when compared to a tabular value--$F_{1, 31, .01} = 7.53$--confirmed a highly statistically significant difference between the means of the two treatment groups. So, the null hypothesis was rejected; the conclusion was that the SOE program planning scores differed for the experimental and control treatment groups. The evidence pointed out that the experimental treatment group performed highly significantly better on the SOE Program Planning Inventory than the control treatment group.

Table 28. ANOVA for the SOE program planning score

Source of variation	Degrees of freedom	Sum of squares	Mean square	F-value
Treatment group	1	2903.03	2903.03	15.22**
Error (schools within group)	31	5913.76	190.77	
Total	32	8816.99		

**Significant at .01.

Summary of tests of hypotheses

For each of the three dependent variables used to evaluate the SOE instructional packet, the experimental treatment group scored higher than the control treatment group on the posttest measure. The SOE knowledge scores and the SOE attitude scores were significantly higher for the posttest than the pretest. This indicated that knowledge of SOE and attitude toward SOE increased and became more positive, respectively, during the experimental phase for the combined groups. Moreover, the experimental treatment group showed a statistically higher ($p < .10$) increase than the control treatment group. Similarly, attitude change from pretest to posttest favored the experimental treatment group; however, this change was not statistically significant. Finally, the experimental treatment group performed highly significantly better ($p < .01$) in planning their SOE programs as measured by the SOE Program Planning Inventory.

CHAPTER V.

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The educational value of supervised occupational experience (SOE) as a component of instruction in vocational agriculture has been established through research. Procedurally, this teaching-learning method requires that students start in the beginning vocational agriculture class to select and plan their individual SOE programs. To complete this task, one of the procedures recommended by researchers involves instruction on the "what, why, and how" of SOE. An instructional packet on SOE programs for beginning vocational agriculture students was developed to aid the vocational agriculture teacher in working with students to select and plan SOE programs.

This study was designed to (1) identify selected personal characteristics of beginning vocational agriculture students in Iowa; (2) identify their educational and occupational plans; (3) determine relationships among these characteristics and scores on an SOE knowledge inventory, an SOE attitude scale, and an SOE program planning inventory; and (4) determine the effectiveness of the instructional packet on SOE.

Beginning vocational agriculture classes in Iowa during the 1977-78 school year served as the population for this research. A random sample of 40 classes was selected to participate in the study. Half were then randomly assigned to an experimental treatment group while the other 20

classes served as the control treatment group. Thirty-three of the classes completed the experiment and furnished data to report the results; useable data were gathered from 17 of the experimental treatment classes and 16 classes of the control treatment group.

The research procedure was experimental, with a pretest-posttest control group research design. The independent, experimental variable that was manipulated by the researcher was the "degree" to which teachers had access to an instructional packet on SOE programs. Two levels of the experimental variable were used: (1) An experimental treatment group was provided the instructional packet, and teachers were given inservice training on its proposed use. (2) The control treatment group teachers were instructed to teach what they "normally" would teach to their beginning vocational agriculture students on SOE. These teachers were not allowed access to the SOE instructional packet.

Five instruments were developed to collect the research data; (1) a questionnaire to elicit personal information and educational and occupational plans from students; (2) an inventory to measure student knowledge of SOE; (3) a scale to quantify students' attitudes toward SOE; (4) an inventory to ascertain the degree to which students had planned their individual SOE programs by the end of the experiment; and (5) a questionnaire to gather personal, situational, and programmatic information from vocational agriculture teachers.

Finally, the data were analyzed to: (1) determine if significant differences existed for selected personal characteristics and educational and occupational plans of students between the two treatment groups;

(2) determine if significant relationships existed among these variables and scores on the dependent variable measures; (3) determine if significant differences existed between pretest and posttest scores on the SOE Knowledge Inventory and the SOE Attitude Scale; and (4) determine if significant differences existed for scores on the SOE Knowledge Inventory, the SOE Attitude Scale, and the SOE Program Planning Inventory between the experimental and control treatment groups.

Conclusions

Based on findings from the sample, the following conclusions concerning beginning vocational agriculture classes in Iowa were drawn:

1. About three-fourths of the students enrolled in beginning vocational agriculture classes lived on farms, and over 60 percent of the students' fathers or guardians were farmers.
2. Over one-half of the students planned to enter occupations in production agriculture, while another 14 percent planned to pursue off-farm agricultural occupations. Totally, more than two-thirds of the students wished to engage in agricultural jobs upon completion of their formal education. Another 21 percent of the students planned to get jobs outside agriculture. Eleven percent of the students were undecided on an occupation.
3. The students were almost equally divided among four categories concerning their immediate plans upon graduation from high school. Approximately one-fourth of the students responded to each of the following four options: (1) attend a vocational

school or community college, (2) attend a four-year college or university, (3) work for yourself (self-employed), and (4) get a full-time job (including military service).

4. Vocational agriculture teachers averaged 32.7 years of age, 9.12 years teaching experience of which 7.73 years have been in their present position, 12.87 years of farming experience since age 12, and only 0.63 years agricultural business experience.
5. Vocational agriculture teachers taught an average of 4.77 classes with 4.55 preparations per day. Each class averaged 12.5 students; the mean departmental enrollment was 56.1 students.
6. The SOE component of vocational agriculture was the basis for about one-fourth of the course grade, and, on the average, the teacher spent almost 13 hours teaching about SOE in the beginning vocational agriculture class. The number of SOE visits per students normally made was 2.73 per year. Over one-half of the schools provided some kind of school facility for SOE; the most popular was a school land laboratory.
7. Vocational agriculture teachers had other responsibilities or involvement in addition to teaching and SOE supervision. Advising the FFA, providing adult and young farmer education, and assisting with fairs were the most common duties. Nearly all teachers were involved in other school duties, with athletic event supervision indicated most often.

8. Fewer than one-half of the teachers had a part-time occupation. Farming was the most popular part-time job, with one-third of the teachers indicating this involvement.
9. Inferential techniques (chi-square or t-test) indicated that random assignment of classes to treatment groups was successful. Only student's place of residence, father's occupation, and father's enrollment in vocational agriculture were significantly associated with the treatment group to which schools were assigned. All other student, teacher, and school variables failed to detect any significant association with treatment group or level.
10. Investigation of the three principal dependent variable data-gathering instruments revealed good coefficients of reliability. Other analytic procedures pointed out that the instruments and scoring procedures used were statistically acceptable measures.
11. Interval-level independent variables revealed relatively few statistically significant coefficients of correlations. Crop acres on student's home farm, animal units on the farm, and percentage of income from farming were intercorrelated, indicating a kind of "orientation toward farming".
12. "Teaching tenure" was seemingly composed of total years taught, tenure in present position, and teacher age. This "teaching tenure" was positively correlated with class size, departmental enrollment, and high school enrollment. Apparently, older teachers taught in larger schools.

13. Number of classes, number of preparations, and total departmental enrollment formed intercorrelations and indicated "teaching load".
14. The three major measures of the dependent variables were highly intercorrelated; they were SOE knowledge score, SOE attitude score, and SOE program planning score.
15. Statistically significant correlations between interval-level independent and dependent variables were few. More importantly, the significant correlations were usually difficult to explain theoretically.
16. Classes scored significantly better on the SOE Knowledge Inventory and the SOE Attitude Scale posttests than on the pretests.
17. The experimental treatment group classes improved their SOE knowledge scores significantly more than the control treatment group classes.
18. The experimental treatment group performed significantly better than the control treatment group on the SOE Program Planning Inventory.

Recommendations

The findings of this research identified characteristics of beginning vocational agriculture students and their teachers, revealed relationships among selected variables, and determined differences

between experimental and control treatment groups. The following recommendations, based on these findings, warrant consideration by those responsible for the administration, supervision, and operation of vocational agriculture programs.

1. The rural background and preference for production agricultural occupations indicate emphasis on supervised farming programs as the dominant types of SOE in Iowa.
2. Those students who have occupational aspirations outside agriculture need guidance to determine their reasons for enrollment in vocational agriculture and to point out other avenues for vocational training.
3. Guidance services should be provided also for those students who are undecided on an occupation.
4. Vocational agriculture instruction must be flexible and individualized to accommodate a wide range of educational aspirations.
5. Vocational agriculture teachers must be provided opportunities to gain experience in off-farm agricultural occupations.
6. The total teaching load of vocational agriculture teachers has reached a maximum for good vocational instruction. In fact, since the findings represent averages, many teachers are overloaded with respect to number of classes, number of preparations, total enrollment, and non-teaching duties. These situations must be alleviated to provide optimum instruction in vocational agriculture.

7. Individual students may serve as the experimental units even though schools (or classes) were the units randomly selected if one considers the school as a "cluster" of students. This procedure, however, should be done only when the independent variable is not "administered" to the class as a whole but to individuals.
8. The SOE Knowledge Inventory, the SOE Attitude Scale, and the SOE Program Planning Inventory may serve as valid and reliable measures of SOE knowledge, attitudes and planning, respectively.
9. Instruction on SOE to beginning vocational agriculture students should continue to be provided.
10. The instructional packet on SOE should be used by vocational agriculture teachers to help them in guiding beginning students to select and plan their individual SOE programs.
11. Inservice education on the intended use of the SOE instructional packet should be given to vocational agriculture teachers. Similarly, prospective teachers may be instructed on its use during their preservice education.

Recommendations for further research

1. The causal relationship of student, teacher, and school situational variables to student SOE knowledge, attitude, and planning should be investigated.
2. The educational and occupational plans of these students should be monitored over an extended period of time.

3. Composite "indicator" variables should be determined based on groupings of intercorrelations in the independent variable correlation matrix.
4. Further investigation of the three instruments used to measure the main dependent variables seems warranted. The SOE Attitude Scale and SOE Program Planning Inventory may be most promising in terms of readily available measures that have been analyzed and refined.
5. A follow-up of these students to determine long time effects of the SOE instructional packet on their SOE involvement is suggested.
6. Other instructional materials should be tested--to determine their effects on student knowledge, attitudes, and abilities--before dissemination to teachers.
7. Additional factors contributing to the development of good SOE programs by beginning students as well as continued involvement by older students should be investigated.
8. Experimental investigations of concepts, procedures, materials, etc., in vocational agriculture should be used whenever feasible to establish true cause-and-effect relationships.

REFERENCES

Abrams, Morris N. 1950. A study of the development of supervised farming programs in vocational agriculture. Ph.D. Thesis. Library, Louisiana State University and Agricultural and Mechanical College, Baton Rouge, Louisiana. 155 pp.

Agricultural Education Department. 1977. Standards for quality vocational programs in agricultural/agribusiness education. Final report. Agricultural Education Department, Iowa State University, Ames, Iowa. 111 pp.

Ahrens, Donald L. 1970. Experimental evaluation of prepared lesson plans on instruction in vocational agriculture. Ph.D. Thesis. Library, Iowa State University, Ames, Iowa. 189 pp.

Allen, Howard B. 1932. A study of the activities of teachers of vocational agriculture in utilizing the pupils' home-farm resources for farm practice. Ph.D. Thesis. Library, Cornell University, Ithaca, New York. 214 pp.

Barker, Richard L. 1967. An appraisal of instructional units to enhance student understanding of profit-maximizing principals. Ph.D. Thesis. Library, The Ohio State University, Columbus, Ohio. 242 pp. University Microfilms, Inc., Ann Arbor, Michigan. (Diss. Abstr. 28:3537-B).

Barr, Anthony J., James H. Goodnight, John P. Sall, and Jane T. Helwig. 1976. A user's guide to SAS·76. SAS Institute, Inc., Raleigh, North Carolina. 329 pp.

Binkley, Harold R. 1955. Evaluation of the supervised farming and practices used by teachers in developing supervised farming programs with high school students in vocational agriculture in Kentucky. Ed.D. Thesis. Library, University of Kentucky, Lexington, Kentucky. 239 pp.

Borg, Walter R. 1963. Educational research: An introduction. David McKay Company, Inc., New York, N.Y. 418 pp.

Byler, Bennie L. 1975. Analysis of factors related to the educational plans of Iowa vocational agriculture students. Department of Agricultural Education, Iowa State University, Ames, Iowa. 245 pp.

Byler, Bennie L. 1976. A comparative study of differences in selected factors related to educational and occupational decision-making between on-farm and off-farm vocational agriculture students. Department of Agricultural Education, Iowa State University, Ames, Iowa. 136 pp.

Byler, Bennie L., and Duane Kaas. 1976. A study of factors associated with the occupational plans of Iowa vocational agriculture students. Department of Agricultural Education, Iowa State University, Ames, Iowa. 154 pp.

Campbell, Donald T., and Julian C. Stanley. 1971. Experimental and quasi-experimental designs for research. 7th ed. Rand McNally and Company, Chicago, Illinois. 84 pp.

Davis, James M. 1953. Supervised farming programs of beginning vocational agriculture students in Wake County with suggestions for improvements. Master's Research Problem. Library, North Carolina State University, Raleigh, North Carolina. 54 pp.

Deems, Howard W. 1950. A study of selected aspects of the vocational agriculture supervised farming program in Nebraska. Master's Thesis. Library, University of Nebraska, Lincoln, Nebraska. 103 pp.

Deyoe, George P., and William D. Masters. 1950. Practices and special factors in selecting and initiating programs of supervised farming in vocational agriculture. Nonthesis Study. Division of Agricultural Education, University of Illinois, Urbana, Illinois. 22 pp.

Ehresman, Norman D. 1966. An experimental study to evaluate the effectiveness of certain structured teaching materials. Ed.D. Thesis. Library, University of Illinois, Urbana, Illinois. 87 pp. University Microfilms, Inc., Ann Arbor, Michigan. (Diss. Abstr. 26:2006-A).

Evans, Robert E. 1942. Pupil reactions to project visitation and supervision in vocational agriculture. Master's Thesis. Library, Pennsylvania State University, State College, Pennsylvania. 43 pp.

Garner, Raymond A. 1951. Practices of teachers of varying proficiency in conducting programs of supervised farming in vocational agriculture in Michigan. Ph.D. Thesis. Library, Michigan State University, East Lansing, Michigan. 391 pp.

Geesey, Richard L. 1976. The effect of the type of instructional materials used in teaching tree identification on the achievement of high school vocational agriculture students. Ph.D. Thesis. Library, The Ohio State University, Columbus, Ohio. 206 pp. University Microfilms, Inc., Ann Arbor, Michigan. (Diss. Abstr. International 37:4785-A).

Gliem, Joseph A. 1976. Effectiveness of a student reference in teaching safety to high school vocational agriculture students. Ph.D. Thesis. Library, Iowa State University, Ames, Iowa. 163 pp.

Hill, James E. 1924. The use of supervised farm practice in teaching vocational agriculture. Master's Thesis. Library, University of Illinois, Urbana, Illinois. 54 pp.

Iowa Vocational Agriculture Teachers Association. 1976. Agricultural experience program records. The Interstate Printers and Publishers, Inc., Danville, Illinois. 72 pp.

Kaas, Duane A. 1976. Comparisons of alternative methods of teaching plant material identification in selected schools of Iowa. Ph.D. Thesis. Library, Iowa State University, Ames, Iowa. 166 pp.

Kahler, Alan A. 1970. An experimental evaluation of the effectiveness of selected techniques and resources on instruction in vocational agriculture. Agricultural and Home Economics Experiment Station, Iowa State University, Ames, Iowa. 34 pp.

Kerlinger, Fred N. 1973. Foundations of behavioral research. Holt, Rinehart and Winston, Inc., New York, N. Y. 741 pp.

King, Charles E. 1953. Practices used in setting up programs of supervised farming for freshman boys in vocational agriculture in Tennessee. Master's Research Problem. Library, University of Tennessee, Knoxville, Tennessee. 36 pp.

Knecht, Verne H. 1959. Factors affecting the success of supervised farming programs in vocational agriculture. Master's Thesis. Library, Iowa State University of Science and Technology, Ames, Iowa. 81 pp.

Krebs, Alfred H. 1967. For more effective teaching. 2nd ed. The Interstate Printers and Publishers, Inc., Danville, Illinois. 249 pp.

Langham, Seburn B. 1977. The development and evaluation of instructional material in farm power machinery. Ph.D. Thesis. Library, Lousiana State University and Agricultural and Mechanical College, Baton Rouge, Louisiana. 182 pp. University Microfilms, Inc., Ann Arbor, Michigan. (Diss. Abstr. International 38:3883-A).

Lawrence, Layle, and Thomas Bean. 1977. Why students drop vocational agriculture. Agricultural Education Magazine 49:161-162.

Lumsdaine, A. A. 1963. Instruments and media of instruction. Pages 583-682 in American Educational Research Association, ed. Handbook of Research on Training. Rand McNally and Company, Chicago, Illinois.

Mabe, Dan E. 1964. Factors influencing the development of productive enterprises of students of vocational agriculture in Idaho. Master's Thesis. Library, Colorado State University, Fort Collins, Colorado.

Magill, Edmund G. 1933. Planning supervised farm practice. Agricultural Education Magazine 6:57-58.

Maltby, Robert D. 1930. Supervised practice in agriculture including home projects. Revised. Vocational Division Bulletin No. 112. Agricultural Series No. 29. U.S. Government Printing Office. 55 pp.

Martin, W. Howard. 1967. Developing supervised occupational experiences in agriculture: A suggested secondary school guide. U.S. Department of Health, Education and Welfare, Washington, D. C. 82 pp.

McMillion, Martin B., and Martin K. Auville. 1976. Factors associated with the success of supervised farming programs of Virginia high school students. Agricultural Education Program, Division of Vocational and Technical Education, Virginia Polytechnic Institute and State University, Blacksburg, Virginia. 164 pp.

Miller, Texton R. 1974. Supervised occupational experience--content for group instruction. Agricultural Education Magazine 46:174-148.

Nie, Norman H., C. Hadlai Hall, Jean G. Jenkins, Karin Steinbrenner, and Dale H. Bent. 1975. SPSS: Statistical package for the social sciences. 2nd ed. McGraw-Hill Book Company, New York, N. Y. 675 pp.

Ostle, Bernard. 1963. Statistics in research. 2nd ed. The Iowa State University Press, Ames, Iowa. 585 pp.

Ridenour, Harlan E. 1965. Guidelines for organizing and operating a state vocational agriculture curriculum materials service. Ph.D. Thesis. Library, The Ohio State University, Columbus, Ohio. 233 pp. University Microfilms, Inc., Ann Arbor, Michigan. (Diss. Abstr. International 27:5-B).

Rodeberg, Hubert E. 1942. The supervised practice program in vocational agriculture in Montana. Master's Thesis. Library, Montana State College, Bozeman, Montana. 97 pp.

Ross, W. A., D. M. Clements, and E. J. Johnson. 1944. Directing vocational agriculture day-school students in developing their farming programs. Bulletin No. 225, Agricultural Series No. 56. Federal Security Agency, U. S. Office of Education, Vocational Division, Washington, D. C. 72 pp.

Sanders, Harry W. 1932. Supervised farm-practice planning. Mimeograph No. 22. Department of Agricultural Education, Virginia Polytechnic Institute and State University, Blacksburg, Virginia. 29 pp.

Shaw, William C. 1947. Improving supervised farming programs in North Carolina by means of parental cooperation. Master's Thesis. Library, North Carolina State University, Raleigh, North Carolina. 90 pp.

Shontz, David F. 1945. Improvement of the supervised farming program in vocational agriculture based on the opinions of former students who are now established in farming. Master's Thesis. Library, Pennsylvania State University, State College, Pennsylvania. 78 pp.

Shontz, David F. 1963. An experiment in teaching agricultural occupations information to help high school students. Ed.D. Thesis. Library, Pennsylvania State University, University Park, Pennsylvania. 108 pp. University Microfilms, Inc., Ann Arbor, Michigan. (Diss. Abstr. 24:5256-A).

Spanton, William T. 1932. Training teachers in supervised farm practice methods. Vocational Division Bulletin No. 165, Agricultural Series No. 42. Federal Board for Vocational Education, Washington, D. C. 125 pp.

Specht, David A. ca. 1975. SPSS: Statistical package for the social sciences version 6 users guide to subprogram reliability and repeated measurements analysis of variance. Department of Sociology, Iowa State University, Ames, Iowa. 38 pp.

Stimson, Rufus W. 1919. Vocational agricultural education by home projects. The Macmillan Company, New York, N. Y. 468 pp.

Stimson, Rufus W., and Frank W. Lathrop. 1942. History of agricultural education of less than college grade in the United States. Vocational Division Bulletin No. 217, Agricultural Series No. 55. U. S. Government Printing Office, Washington, D. C. 648 pp.

Sweaney, Harvey P., and James A. Starrak. 1941. Iowa Agricultural Experiment Station. Bulletin P29. 32 pp.

Taylor, Henry L. 1951. A study of the supervised farming programs of Negro pupils studying vocational agriculture in high schools in Tennessee. Ph.D. Thesis. Library, Cornell University, Ithaca, New York. 249 pp.

Tillman, Charles J. D. 1976. Extent and use of agricultural education instructional materials by vocational agriculture teachers in Virginia. Ph.D. Thesis. Library, Virginia Polytechnic Institute and State University, Blacksburg, Virginia. 132 pp. University Microfilms, Inc., Ann Arbor, Michigan. (Diss. Abstr. International 37:1939-A).

Timmerman, Albert, Jr. 1956. A study of methods and techniques used by teachers of vocational agriculture in Area III to create and maintain interest in a supervised farming program. Master's Report. Department of Agricultural Education, Texas A&M University, College Station, Texas. 14 pp.

Urbanic, Charles E. 1971. Effectiveness of the use of a student reference in teaching ornamental horticulture to high school students. Ph.D. Thesis. Library, The Ohio State University, Columbus, Ohio. 271 pp. University Microfilms, Inc., Ann Arbor, Michigan. (Diss. Abstr. International 32:2002-A).

Warren, Charles L. 1952. Problems related to the supervised farming programs of in-school students of vocational agriculture in North Carolina. Master's Thesis. Library, North Carolina State University, Raleigh, North Carolina. 59 pp.

Warren, Richard D., Gerald E. Klonglan, and Medhat M. Sabri. 1969. The certainty method: Its application and usefulness in developing empirical measures in social sciences. Rural Sociology Report No. 82. Department of Sociology and Anthropology, Iowa State University, Ames, Iowa. 38 pp.

Williams, Arthur P. 1932. Supervised farm practice planning. Vocational Division Bulletin No. 163. Agricultural Series No. 41. Federal Board for Vocational Education. Washington, D. C. 88 pp.

Williams, David L. 1975. Developing supervised occupational experiences in agriculture. Project outline. Agriculture and Home Economics Experiment Station, Iowa State University, Ames, Iowa. 4 pp.

Williams, David L. 1977a. A study of supervised occupational experience programs of Iowa vocational agriculture students. Department of Agricultural Education, Iowa State University, Ames, Iowa. 99 pp.

Williams, David L. 1977b. Relationships between vocational agriculture students' supervised occupational experience and selected variables. The Journal of Vocational Education Research 2:17-28.

Williams, David L. 1977c. An instructional packet on supervised occupational experience programs of beginning vocational agriculture students. The Department of Agricultural Education, Iowa State University, Ames, Iowa. 91 pp. [Unpublished material].

Williams, David L. 1978. Supervised occupational experience. Agricultural Education Magazine 50:156-157.

Williams, David L., and Willie Rawls. 1977. Supervised occupational experience. Agricultural Education Magazine 49:152-153.

Wilson, Russell C. 1971. Effectiveness of teaching electricity to high school students by varied class time sequences and teaching materials. Ph.D. Thesis. Library, The Pennsylvania State University, University Park, Pennsylvania. 124 pp. University Microfilms, Inc., Ann Arbor, Michigan. (Diss. Abstr. International 32:2564-A).

Winer, Ben J. 1962. Statistical principles in experimental design. McGraw-Hill, Inc., New York, N. Y. 672 pp.

Young, Alton. 1940. Inhibiting factors in supervised farming practice. Special Master's Report. Library, Colorado State University, Fort Collins, Colorado. 82 pp.

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Dr. David L. Williams - for his leadership as director of Project 2150, Agriculture Experiment Station, of which this research is a part; for chairing my graduate committee.

Dr. Harold Crawford - for offering me a position and financial support to make graduate study possible; for serving as a member of my committee.

Dr. Richard I. Carter - for showing me that teacher education and graduate study could be done at the same time; for serving as a member of my committee.

Dr. Lauren Christian - for his excellent course on experimentation and for serving on my committee.

Dr. Richard D. Warren - for his willingness to offer advice and consultation on statistical procedures and for serving on my committee.

The vocational agriculture teachers and students - for participating in the research study.

My children, Scott and Leslie, were helpful in a special way, too.

Finally, I appreciate especially my wife, Sandra, because of her encouragement, patience, understanding, and typing.

APPENDIX A: CORRESPONDENCE

Iowa State University of Science and Technology Ames, Iowa 50011

Department of Agricultural Education
223 Curtiss Hall
Telephone 515-294-5872

The Agricultural Education Department is initiating a project funded by the Iowa Agriculture Experiment Station to study the effectiveness of an instructional packet on selecting and planning supervised occupational experience (SOE) programs by beginning vocational agriculture students. Your department was randomly selected to participate in this study from among all Iowa schools offering vocational agriculture. Your superintendent has already given us permission to contact you about participating in the study.

We will be trying to determine the factors that contribute to the selection and planning of SOE programs by beginning vocational agriculture students. In this situation, we are using SOE to include all the kinds of agricultural experiences in which a student may participate - supervised farming programs, farm placement, etc.

More specifically, we ask that you meet the following criteria:

1. Have taught in your current school at least one year.
2. Use the new Iowa Vocational Agriculture Record Book with your first-year students.
3. Teach a unit on SOE programs using the instructional packet which we will provide. We would furnish the instructional materials - teaching plans, materials for parents, transparencies, handout masters, slides, etc. - and ask that you teach a unit of approximately three weeks to your beginning students between the beginning of school and November 11, 1977.

If you would meet these criteria and agree to participate in the study, we would ask you to collect information from your beginning vocational agriculture students preceding your teaching the SOE unit and again immediately after the unit. Also, we would ask you to respond to a questionnaire.

We feel this study will help your vocational agriculture department as well as agriculture programs throughout Iowa. Our ultimate goal is to produce a

tested instructional packet which can be distributed to all Iowa vocational agriculture teachers. Please rest assured that we are not evaluating you or your school. All data gathered will be reported in group summary form. We would, however, give you feedback on the information given by your students.

Please use the enclosed stamped postcard to give us your response so we can plan the next step of the project. If you have any questions, indicate on the postcard or call us at (515) 294-5872.

Sincerely,

Gary Briers

Gary E. Briers
Instructor
Agricultural Education

David L. Williams
Associate Professor
Agricultural Education

Enclosure: Stamped return postcard

GEB:jas

Iowa State University of Science and Technology Ames, Iowa 50010

Department of Agricultural Education
223 Curtiss Hall
Telephone 515-294-5872

June 13, 1977

The Agricultural Education Department at Iowa State University is initiating a study funded by the Agriculture Experiment Station to evaluate the effectiveness of instruction pertaining to supervised occupational experience programs in vocational agriculture. Your school was randomly selected to participate in this study from among all Iowa schools offering vocational agriculture.

We ask your permission to contact your vocational agriculture teacher about participating in the study. He would be asked to make slight modifications in the instructional program, to collect data from the vocational agriculture students pertaining to selecting and planning supervised occupational experience programs, and to provide information himself. With your approval we shall contact your vocational agriculture instructor. We think this study will help your vocational agriculture department as well as the agriculture programs throughout Iowa.

Please use the enclosed stamped postcard to give us your response so we can plan the next step of the research project. If you have any questions, indicate on the postcard or call us at (515)294-5872.

Sincerely,

Gary Briers

Gary E. Briers
Instructor
Agricultural Education

David L. Williams
Associate Professor
Agricultural Education

Enclosure: Stamped return postcard

Iowa State University of Science and Technology Ames, Iowa 50011

Department of Agricultural Education
223 Curtiss Hall
Telephone 515-294-5872

The Agricultural Education Department is initiating a project funded by the Iowa Agriculture Experiment Station to study supervised occupational experience (SOE) programs in vocational agriculture. Your department was randomly selected to participate in this study from among all Iowa schools offering vocational agriculture. Your superintendent has already given us permission to contact you about participating in the study.

We will be trying to determine the factors that contribute to the selection and planning of SOE programs by beginning students of vocational agriculture. In this situation, we are using SOE to include all the kinds of agricultural experiences in which a student may participate - supervised farming programs, farm placement, etc.

More specifically, we ask that you meet the following criteria:

1. Have taught in your current school at least one year.
2. Use the new Iowa Vocational Agriculture Record Book with your first-year students.
3. Teach a unit on SOE programs to your first-year students between the beginning of the school year and November 11, 1977.

If you meet these criteria and would agree to participate in the study, we would ask you to collect information from your beginning vocational agriculture students preceding your teaching the SOE unit and again immediately after the unit. Also, we would ask you to respond to a questionnaire.

We feel this study will help your vocational agriculture department as well as agriculture programs throughout Iowa. Our ultimate goal is to produce an instructional packet on developing SOE programs for use by teachers like yourself. Please rest assured that we are not evaluating you or your school. All data gathered will be reported in group summary form. We would, however, give you feedback on the information given by your students.

Please use the enclosed stamped postcard to give us your response so we can plan the next step of the project. If you have any questions, indicate on the postcard or call us at (515) 294-5872.

Sincerely,

Gary Briers

Gary E. Briers
Instructor, Agricultural Education

David L. Williams
Assoc. Professor, Ag. Ed.

Enclosure: Stamped return postcard

GEB:jas

Iowa State University of Science and Technology Ames, Iowa 50011

Department of Agricultural Education
223 Curtiss Hall
Telephone 515-294-5872

Date: August 15, 1977

To: SOE Project Participants

From: Gary Briers

Gary E. Briers
Instructor
Agricultural Education

Topic: SOE Project In-service Meetings

Thank you for agreeing to participate in the project to study the effectiveness of an instructional packet on "selecting and planning supervised occupational experience (SOE) programs by beginning vocational agriculture students."

We have scheduled a short in-service meeting with you and other teachers in the study to introduce the instructional materials to you. We feel this meeting will be a valuable part of the project, and we certainly urge you to attend one of the three meetings. The instructional packet -- teaching plans, slides, transparencies, student handout masters, and other teaching materials will be given to you at the meeting. Also, the use of the materials will be explained. You will be provided with data collection materials, too. Finally, we will explain procedures for collecting information from your students before and after teaching the SOE unit.

We look forward to working with you in this effort to improve SOE programs of Iowa vocational agriculture students. Please call me at 515/294-5872 if you have any questions or concerns.

Enclosure: In-service Meetings for SOE Project

GEB:jas

INSERVICE MEETING ON USE OF INSTRUCTIONAL PACKET ON SOE FOR SELECTED VO-AG INSTRUCTORS

AGENDA

1. Reviewing basic research findings pertaining to SOE.

    a. students think SOE is important
    b. factors to consider in planning and conducting SOE programs

2. Examining the instructional packet

    a. organization
    b. content
    c. techniques

3. Using the packet

    a. problem area 1
    b. problem area 2
    c. student-parents meeting
    d. problem area 3
    3. scheduled time for use and number of students

4. Collecting information from students

    a. before teaching the unit
    b. after teaching the unit

5. Recording teacher information

    a. while teaching the unit
    b. after teaching the unit

6. Distributing supportive materials

    a. interest inventory and answer sheets
    b. informed consent sheets
    c. slides
    d. information collection materials

Iowa State University of Science and Technology Ames, Iowa 50011

Department of Agricultural Education
223 Curtiss Hall
Telephone 515-294-5872

Date: August 16, 1977

To:

From: Gary Briers
Gary E. Briers
Instructor

Subject: SOE Project

Thank you for agreeing to participate in the project to study supervised occupational experience (SOE) programs in vocational agriculture. As we indicated in our earlier letter, we would ask you to collect information from your beginning vocational agriculture students preceding your teaching your SOE unit and again immediately after the unit.
Here are the steps to follow in completing the project:

1. Indicate on the bottom of this page the approximate number of students in your beginning vocational agriculture class for fall, 1977. We will use this figure to determine the number of "tests" you will need.
2. Indicate the approximate dates that you will be teaching your SOE unit to your beginning students. This will enable us to mail you the materials on time. Please stay between the dates of September 15 and November 15 to teach your SOE unit.
3. Your "pre-test" materials should arrive three to four days before you begin teaching the unit. Directions for administering and returning the pretest will be enclosed.
4. Your "post test" materials should arrive before the end of your SOE unit. Additional directions will be included.

So, we just need the number of students and dates at this time. Please tear off the bottom portion of this letter and return it to me. If you have any questions, please indicate on the form or call 515/294-5872.

I will have approximately _____ students in my beginning vocational
(number)
agriculture class this fall. I plan to teach my SOE unit between the dates

of _____, 1977, and _____, 1977.
(start) (end)

RETURN TO:
Gary E. Briers
Agricultural Education Dept.
223 Curtiss Hall
Iowa State University
Ames, Iowa 50011

Iowa State University of Science and Technology Ames, Iowa 50011

Department of Agricultural Education
223 Curtiss Hall
Telephone 515-294-5872

Date:

To:
Vocational Agriculture Teacher

From: Gary Briers
Gary Briers, Instructor

Subject: Data Collection After Teaching Your SOE Unit

Here are the forms to get information from your students after you've finished teaching your SOE unit. Enclosed should be sufficient copies of the following forms:

1. Supervised Occupational Experiences Knowledge Inventory (salmon).
2. Supervised Occupational Experiences Attitude Inventory (yellow).
3. Planning and Selecting an SOE Program (green).

Directions:

1. You should administer these forms shortly after teaching your SOE unit. Again, approximately one hour will be needed to complete them.
2. The students will no doubt recognize that two of these forms are very similar to the earlier ones. Please emphasize to them the importance of answering all three forms as carefully and truthfully as possible.
3. A form is also included for you to fill out (buff). Please complete it and sign the "informed consent form."
4. All four forms--three from each student and yours--should be returned to:

Gary E. Briers, Instructor
Agricultural Education
223 Curtiss Hall
Iowa State University
Ames, Iowa 50011

Thanks once more for your valuable assistance in conducting this study. I will most definitely give you feedback on the information collected. Please don't hold me to a particular date, though!

Enclosures

Iowa State University of Science and Technology Ames, Iowa 50011

Department of Agricultural Education
223 Curtiss Hall
Telephone 515-294-5872

Date:

To: Vocational Agriculture Teacher

From: _____
Gary E. Briers
Instructor

Subject: Data Collection Before Teaching SOE Unit

Enclosed are multiple copies of forms to collect information from your beginning vocational agriculture students before you teach your SOE unit. You should have an adequate number of the following items:

1. Student Data Related to Selecting and Planning SOE Programs in Vocational Agriculture (White)
2. Supervised Occupational Experiences Knowledge Inventory (Gold)
3. Supervised Occupational Experiences Attitude Inventory (Blue)
4. Letter to Parents with Informed Consent Form

Directions:

1. Administer the first three forms (1-3) to get information from the students. This should be done just prior to teaching your SOE unit. About one hour will be needed for the students to respond to the forms.
2. The directions should be self-explanatory to the students. Please emphasize to them that they should respond to <u>each</u> question or statement.
3. Distribute the parents' letter and enclosure (Informed Consent Form) to each student. It is <u>essential</u> that we have this form returned.
4. Mail all four items from each student to:

   Gary E. Briers
   Agricultural Education
   223 Curtiss Hall
   Iowa State University
   Ames, Iowa 50011

Thanks again for your help and cooperation. I will mail the forms to use at the <u>end</u> of your SOE unit soon. If you have any questions, please call me at 515/294-5872.

GEB:mji

enclosures

APPENDIX B: SCHOOLS AND VOCATIONAL AGRICULTURE TEACHERS PARTICIPATING IN THE STUDY

Schools and Vocational Agriculture Teachers Participating in the Study

Experimental Treatment

School	Teacher
Atlantic	Ronald D. Beaver
Davis County, Bloomfield	DeWitt S. Shelton
Harmony, Farmington	William W. Cottrell, Jr.
Guthrie Center	Nicholas N. Bradley
Kanawha	Larry L. Stine
Keota	Duane W. Sprouse
Knoxville	Brent Hanna
Lake City	Rudolph E. Engstrom
CAL, Latimer	Bill L. Umbaugh
Pella	Jerry L. Krug
Pomeroy	Alan J. Fiala
Clay Central, Royal	David A. Binder
Sigourney	Thomas D. Davis, Jr.
Starmont, Strawberry Point	Dennis G. Miller
Stuart-Menlo, Stuart	Daniel R. Wilson
Terril	Stanley L. Anderson
West Bend	Robert H. Cast

Control Treatment

United, Boone	Thomas D. Kamp
Colo	Lyle J. Stewart
Wayne, Corydon	Robert R. Shelton
Fort Madison	G. L. Hayes
George	Richard A. Sprague
Lone Tree	Edward J. Miller
Manson	Allen S. Halvorsen
Mediapolis	James R. Howell
Prairie City	Thomas G. Ross
Southeast Polk, Runnels	James A. Appleget
Sac City	Daniel R. Miller
St. Ansgar	Merle H. Hanson
Sheffield-Chapin, Sheffield	Ron L. Eichmeier
Sheldon	Frederick A. VanLoh
Tri-County, Thornburg	Richard L. Blizzard
West Branch	Francis L. Abel

APPENDIX C: INFORMED CONSENT FORM

INFORMED CONSENT FORM

Informed Consent of Student

I voluntarily agree to participate in the activities associated with the study of supervised occupational experience programs in my vocational agriculture class. I further understand that the information which I provide will be held in confidence and that my responses will be combined with other responses and used only in the interest of improving instruction in vocational agriculture.

_____ (Date)

_____ (Print Name of Student)

_____ (Signature of Student)

_____ (Box Number or Route Number)

_____ (Town) (State) (Zip)

_____ (Name of School)

Informed Consent of Parent/Guardian

My son/daughter _____ (Name) has my permission to participate in the activities described above.

_____ (Date)

_____ (Print Name of Parent)

_____ (Signature of Parent/Guardian)

APPENDIX D: INSTRUMENTS FOR DATA COLLECTION

NAME _____ SCHOOL _____

STUDENT DATA RELATED TO SELECTING AND PLANNING
SOE PROGRAMS IN VOCATIONAL AGRICULTURE

Please answer each of the questions with an "X" or fill in the blank provided. Be as accurate as possible and please respond to all questions.

1. Where do you live?
___ (1) In a town or city
___ (2) In the rural area, but not on a farm
___ (3) On a farm

2. What occupation (job) do you plan to enter upon completion of your formal education?

_____

3. In what kinds of activities do you participate? (Check all that apply.)
___ (1) Athletics
___ (2) Music
___ (3) Student government
___ (4) 4-H
___ (5) Other (list) _____

4. Are you presently or do you plan to become a member of the FFA?
___ (1) Yes
___ (2) No

5. What are your immediate plans upon completion of high school?
___ (1) Attend an area vocational school or community college
___ (2) Attend a four-year college or university
___ (3) Work for yourself (self-employed)
___ (4) Get a full-time job
___ (5) Other (describe) _____

6. What grades do you normally get in school?
___ (1) Mostly Fs.
___ (2) Mostly Ds.
___ (3) Mostly Cs.
___ (4) Mostly Bs.
___ (5) Mostly As.

7. How many total acres does your family own and/or rent?

_____ acres

8. How many crop acres does your family farm?

_____ acres

9. What is the total number of swine, cattle, sheep, and horses on your family's farm?

_____ animal units

10. What percent of your family's income comes from the farm?

_____ %

11. What is your father's or guardian's occupation?

_____

12. Was your father or guardian ever in vocational agriculture while he was in high school?
___ (1) Yes
___ (2) No

13. Do you have any brothers or sisters who were or are currently in vocational agriculture?
___ (1) Yes
___ (2) No

14. Does your father or guardian attend young or adult farmer classes if offered by the vocational agriculture department?
___ (1) Yes
___ (2) No
___ (3) Not offered in my school

15. Is your father or guardian a member of the vocational agriculture advisory council?
___ (1) Yes
___ (2) No

NAME _____ SCHOOL _____

SUPERVISED OCCUPATIONAL EXPERIENCES

KNOWLEDGE INVENTORY

Supervised occupational experience (SOE) programs are often called vo-ag projects, supervised farming programs, home projects, FFA projects, or similar terms. Mark with an "X" the phrase that most correctly completes the statement. Please mark an answer for each statement.

1. Adjusting a corn planter for depth is an example of:
___ (1) an agricultural improvement project.
___ (2) an agricultural skill.
___ (3) a productive enterprise.
___ (4) an agricultural employment.

2. The three components or parts of instruction in vocational agriculture are:
___ (1) classroom-laboratory instruction, SOE, and FFA.
___ (2) lecture, discussion, and supervised study.
___ (3) animal science, plant science, and agricultural mechanics.
___ (4) the shop, the classroom, and contests.

3. The most important people involved in <u>supervising</u> your SOE are:
___ (1) fellow students and your brothers and sisters.
___ (2) FFA officers and committee chairmen.
___ (3) your parents and your vocational agriculture teacher.
___ (4) all your teachers, the principal and superintendent, and school board members.

4. The most important factors to consider in selecting your SOE program are:
___ (1) your parents' desires, other students' programs, and your teacher's desires.
___ (2) your interests, your previous experiences, and existing opportunities.
___ (3) examples, textbook situations, and local agriculture.
___ (4) FFA degree requirements, proficiency awards, and judging contests.

5. The SOE programs for most beginning vocational agriculture students consist of:
___ (1) vo-ag class, FFA membership, and agricultural mechanics.
___ (2) productive enterprises, improvement projects, and agricultural skills.
___ (3) agribusiness employment, occupational orientation, and observation.
___ (4) interviewing, recording, and following agricultural workers.

6. A sow and litter owned by the student is an example of:
___ (1) an agricultural improvement project.
___ (2) an agricultural skill.
___ (3) a productive enterprise.
___ (4) an agricultural employment.

7. Erosion control in which the student plans and carries out the program but receives no financial reward is an example of:
___ (1) an agricultural improvement project.
___ (2) an agricultural skill.
___ (3) a productive enterprise.
___ (4) an agricultural employment.

8. The day-to-day supervision of your SOE program is the responsibility of:
___ (1) the vo-ag teacher.
___ (2) your parents or employer.
___ (3) the school principal.
___ (4) the FFA president.

9. The coordination of learning activities provided through the classroom and laboratory, FFA, and SOE is the job of:
___ (1) your parents or employer.
___ (2) the vo-ag teacher.
___ (3) the career education director.
___ (4) the school principal.

10. Your SOE program is a part of vocational agriculture that provides for:
___ (1) group instruction in the classroom.
___ (2) individualized instruction at SOE site.
___ (3) training of FFA judging team.
___ (4) achievement of FFA awards.

11. Goals for your SOE program should be written and recorded:
___ (1) in your vo-ag class notes.
___ (2) in your Agricultural Experience Program Records.
___ (3) on a barn door.
___ (4) on a calendar.

12. The term used to describe all the planned agricultural activities of educational value conducted by you outside of class for which systematic instruction and supervision are provided is:
___ (1) orientation to agriculture.
___ (2) vocational agriculture.
___ (3) Future Farmers of America.
___ (4) supervised occupational experience.

13. The best way that people learn to perform tasks and jobs in agricultural occupations is by:
___ (1) going to school.
___ (2) watching and observing someone do them.
___ (3) doing them and working with someone who knows.
___ (4) listening in class and taking good notes.

14. The best way to get practical experiences related to topics studied in vo-ag classes is to:
___ (1) perform each task under teacher or parent supervision.
___ (2) attend class regularly.
___ (3) participate in judging contests and leadership contests.
___ (4) read and study the vocational agriculture text.

15. PCA (Production Credit Association) is a possible source for you to:
___ (1) market your crops.
___ (2) obtain machinery for your SOE.
___ (3) receive financing for your SOE.
___ (4) obtain livestock production information.

16. The long-range plans for your SOE program should cover:
___ (1) one year.
___ (2) two years.
___ (3) three years.
___ (4) four years.

17. Your SOE agreement should be signed by:
___ (1) you, your parents, and vo-ag teacher.
___ (2) you, the FFA president, and your parents.
___ (3) you, the vo-ag teacher, and the principal.
___ (4) the vo-ag teacher, principal, and your parents.

18. The term used to describe the written record of the basic understanding regarding your SOE program and to promote relations among the persons involved is:
___ (1) a training plan.
___ (2) a note.
___ (3) an agreement.
___ (4) a long-range plan.

19. Detailed plans for your SOE program are important because they:
___ (1) include a list of jobs which you will need to do.
___ (2) tell your teacher about your SOE program.
___ (3) are required for a grade in vo-ag.
___ (4) are a part of your vo-ag class notes.

20. To conduct your SOE program, your most important needs are:
___ (1) facilities and finances.
___ (2) time and money.
___ (3) strength and knowledge.
___ (4) a job and hobbies.

21. Your SOE agreement should be developed to:
___ (1) indicate long-range plans for your SOE program.
___ (2) record understandings between your parents, your teacher, and yourself.
___ (3) show what you have learned in vocational agriculture.
___ (4) practice filling out forms and applications.

22. To identify <u>financing</u> required for your SOE program, you must:
___ (1) develop a budget.
___ (2) buy your enterprises.
___ (3) talk to other students.
___ (4) have a large savings.

23. A goal of a 95% calf crop is an example of:
___ (1) a long range plan.
___ (2) scope or size.
___ (3) an efficiency factor.
___ (4) diversity.

24. In order to determine the profit possible from a productive enterprise, you should develop:
___ (1) an experience plan.
___ (2) a budget.
___ (3) a set of goals.
___ (4) an agreement.

25. The major purpose of SOE is to help you:
___ (1) learn to do tasks in agriculture.
___ (2) make money.
___ (3) receive FFA awards and degrees.
___ (4) meet school requirements for vocational agriculture.

26. SOE directly benefits:
___ (1) your teachers, the school administration, and local bankers.
___ (2) livestock, crops, and agricultural machinery.
___ (3) you--the student, the school curriculum, and the community and home.
___ (4) the local, state, and national FFA.

27. Assistance in selecting your SOE should come mainly from:
___ (1) your brothers and sisters.
___ (2) your classmates and FFA members.
___ (3) your parents and your vocational agriculture teacher.
___ (4) the FFA officers and committee chairmen.

28. Assistance in planning your SOE should come mainly from:
___ (1) your brothers and sisters and neighbors.
___ (2) your fellow FFA members, FFA officers, and FFA committee chairmen.
___ (3) all your teachers, your fellow classmates, and friends.
___ (4) your vocational agriculture teacher and your parents or your employer.

29. Plans for your SOE should be done:
___ (1) month by month and long range.
___ (2) monthly only.
___ (3) long range only.
___ (4) year by year.

30. Goals for your SOE program should be stated in terms of:
___ (1) inputs and outcomes.
___ (2) ease of completion and attainment.
___ (3) length of time and amount of labor required.
___ (4) scope and efficiency.

NAME _____ SCHOOL _____

SUPERVISED OCCUPATIONAL EXPERIENCES

KNOWLEDGE INVENTORY

Supervised occupational experience (SOE) programs are often called vo-ag projects, supervised farming programs, home projects, FFA projects, or similar terms. Mark with an "X" the phrase that most correctly completes the statement. Please mark an answer for each statement.

1. The term used to describe all the planned agricultural activities of educational value conducted by you outside of class for which systematic instruction and supervision are provided is:
___ (1) Future Farmers of America.
___ (2) supervised occupational experience.
___ (3) orientation to agriculture.
___ (4) vocational agriculture.

2. Plans for you SOE should be done:
___ (1) monthly only.
___ (2) long range only.
___ (3) year by year.
___ (4) month by month and long range.

3. Goals for your SOE program should be stated in terms of:
___ (1) scope and efficiency.
___ (2) ease of completion and attainment.
___ (3) inputs and outcomes.
___ (4) length of time and amount of labor required.

4. The SOE programs for most beginning vocational agriculture students consist of:
___ (1) agribusiness employment, occupational orientation, and observation.
___ (2) vo-ag class, FFA membership, and agricultural mechanics.
___ (3) productive enterprises, improvement projects, and agricultural skills.
___ (4) interviewing, recording, and following agricultural workers.

5. To conduct your SOE program, your most important needs are:
___ (1) time and money.
___ (2) facilities and finances.
___ (3) a job and hobbies.
___ (4) strength and knowledge.

6. Assistance in <u>planning</u> your SOE should come mainly from:
___ (1) all your teachers, your fellow classmates, and friends.
___ (2) your brothers and sisters and neighbors.
___ (3) your vocational agriculture teacher and your parents or your employer.
___ (4) your fellow FFA members, FFA officers, and FFA committee chairmen.

7. The three components or parts of instruction in vocational agriculture are:
___ (1) classroom-laboratory instruction, SOE, and FFA.
___ (2) lecture, discussion, and supervised study.
___ (3) animal science, plant science, and agricultural mechanics.
___ (4) the shop, the classroom, and contests.

8. PCA (Production Credit Association) is a possible source for you to:
___ (1) receive financing for your SOE.
___ (2) market your crops.
___ (3) obtain livestock production information.
___ (4) obtain machinery for your SOE.

9. The coordination of learning activities provided through the classroom and laboratory, FFA, and SOE is the job of:
___ (1) the vo-ag teacher.
___ (2) the school principal.
___ (3) your parents or employer.
___ (4) the career education director.

10. SOE directly benefits:
___ (1) your teachers, the school administration, and local bankers.
___ (2) livestock, crops, and agricultural machinery.
___ (3) you--the student, the school curriculum, and the community and home.
___ (4) the local, state, and national FFA.

11. The most important people involved in <u>supervising</u> your SOE are:
___ (1) FFA officers and committee chairmen.
___ (2) your parents and your vocational agriculture teacher.
___ (3) fellow students and your brothers and sisters.
___ (4) all your teachers, the principal and superintendent, and school board members.

12. Your SOE agreement should be signed by:
___ (1) you, your parents, and vo-ag teacher.
___ (2) the vo-ag teacher, principal, and your parents.
___ (3) you, the FFA president, and your parents.
___ (4) you, the vo-ag teacher, and the principal.

13. To identify <u>financing</u> required for your SOE program, you must:
___ (1) talk to other students.
___ (2) buy your enterprises.
___ (3) develop a budget.
___ (4) have a large savings.

14. The term used to describe the written record of the basic understanding regarding your SOE program and to promote relations among the persons involved is:
___ (1) a long-range plan.
___ (2) an agreement.
___ (3) a note.
___ (4) a training plan.

15. Assistance in selecting your SOE should come mainly from:
___ (1) your parents and your vocational agriculture teacher.
___ (2) the FFA officers and committee chairmen.
___ (3) your classmates and FFA members.
___ (4) your brothers and sisters.

16. The long-range plans for your SOE program should cover:
___ (1) four years.
___ (2) three years.
___ (3) two years.
___ (4) one year.

17. The best way to get practical experiences related to topics studied in vo-ag classes is to:
___ (1) perform each task under teacher or parent supervision.
___ (2) attend class regularly.
___ (3) participate in judging contests and leadership contests.
___ (4) read and study the vocational agriculture text.

18. In order to determine the profit possible from a productive enterprise, you should develop:
___ (1) an agreement.
___ (2) an experience plan.
___ (3) a budget.
___ (4) a set of goals.

19. Your SOE program is a part of vocational agriculture that provides for:
___ (1) training of FFA judging team.
___ (2) individualized instruction at SOE site.
___ (3) achievement of FFA awards.
___ (4) group instruction in the classroom.

20. The major purpose of SOE is to help you:
___ (1) receive FFA awards and degrees.
___ (2) learn to do tasks in agriculture.
___ (3) meet school requirements for vocational agriculture.
___ (4) make money.

21. A sow and litter owned by the student is an example of:
___ (1) a productive enterprise.
___ (2) an agricultural employment.
___ (3) an agricultural skill.
___ (4) an agricultural improvement project.

22. The most important factors to consider in selecting your SOE program are:
___ (1) your interests, your previous experiences, and existing opportunities.
___ (2) examples, textbook situations, and local agriculture.
___ (3) your parents' desires, other students' programs, and your teacher's desires.
___ (4) FFA degree requirements, proficiency awards, and judging contests.

23. The day-to-day supervision of your SOE program is the responsibility of:
___ (1) the vo-ag teacher.
___ (2) the FFA president.
___ (3) the school principal.
___ (4) your parents or employer.

24. Goals for your SOE program should be written and recorded:
___ (1) in your Agricultural Experience Program Records.
___ (2) on a barn door.
___ (3) in your vo-ag class notes.
___ (4) on a calendar.

25. Your SOE agreement should be developed to:
___ (1) record understandings between your parents, your teacher, and yourself.
___ (2) show what you have learned in vocational agriculture.
___ (3) practice filling out forms and applications.
___ (4) indicate long-range plans for your SOE program.

26. Detailed plans for your SOE program are important because they:
___ (1) include a list of jobs which you will need to do.
___ (2) are a part of your vo-ag class notes.
___ (3) are required for a grade in vo-ag.
___ (4) tell your teacher about your SOE program.

27. Adjusting a corn planter for depth is an example of:
___ (1) an agricultural employment.
___ (2) a productive enterprise.
___ (3) an agricultural improvement project.
___ (4) an agricultural skill.

28. Erosion control in which the student plans and carries out the program but receives no financial reward is an example of:
___ (1) a productive enterprise.
___ (2) an agricultural skill.
___ (3) an agricultural employment.
___ (4) an agricultural improvement project.

29. A goal of a 95% calf crop is an example of:
___ (1) an efficiency factor.
___ (2) diversity.
___ (3) a long range plan.
___ (4) scope or size.

30. The best way that people learn to perform tasks and jobs in agricultural occupations is by:
___ (1) going to school.
___ (2) watching and observing someone do them.
___ (3) listening in class and taking good notes.
___ (4) doing them and working with someone who knows.

NAME _____ SCHOOL _____

SUPERVISED OCCUPATIONAL EXPERIENCES

ATTITUDE INVENTORY

Supervised occupational experience (SOE) programs are often called vo-ag projects, supervised farming programs, home projects, FFA projects, or similar terms. The following list of statements is NOT a test. There are no right or wrong answers. If you strongly disagree with the statement, write "1" on the line in front of the item. If you strongly agree, write "11" on the line. Use any number from 1 to 11. Please give your own opinion, and respond to each item.

1	2	3	4	5	6	7	8	9	10	11
Strongly disagree				Slightly disagree	Undecided	Slightly agree				Strongly agree

_____ 1. My interests in agriculture can be measured.

_____ 2. My experiences should be used in planning my SOE.

_____ 3. SOE gives me a chance to use approved business procedures.

_____ 4. My parents are important in helping me select my SOE.

_____ 5. My vo-ag teacher should help me plan my SOE.

_____ 6. SOE helps me set educational goals.

_____ 7. SOE helps me get FFA degrees and awards.

_____ 8. SOE helps me earn money while still in school.

_____ 9. My vo-ag teacher is important in selecting my SOE.

_____ 10. SOE promotes a better relationship between me and my vo-ag teacher.

_____ 11. SOE expands the vocational agriculture program.

_____ 12. SOE helps me learn to keep records.

_____ 13. SOE develops my interests in agriculture.

_____ 14. SOE helps me learn to work with others.

_____ 15. Classwork, SOE, and FFA are all parts of a good vocational agriculture program.

_____ 16. SOE is a way for me to grow into farming.

_____ 17. My vo-ag teacher should help in supervising my SOE.

1	2	3	4	5	6	7	8	9	10	11
Strongly disagree				Slightly disagree	Undecided	Slightly agree				Strongly agree

_____ 18. I can learn lots from my SOE program that I could not learn in the vo-ag classroom.

_____ 19. SOE helps me set career goals.

_____ 20. SOE is important to all vo-ag students.

_____ 21. SOE promotes cooperation between my parents and my vo-ag teacher.

_____ 22. Long-range planning of my SOE is important.

_____ 23. SOE promotes the use of approved agricultural practices.

_____ 24. SOE helps prepare me for an agricultural occupation.

_____ 25. My parents should help in supervising my SOE.

_____ 26. SOE helps make my vo-ag class practical.

_____ 27. SOE benefits the community.

_____ 28. Budgeting is important in planning my SOE program.

_____ 29. My agricultural interest is important to consider in selecting my SOE.

_____ 30. Planning my SOE is an important step in conducting an SOE program.

_____ 31. My parents are important in helping me plan my SOE.

_____ 32. SOE lets me look in-depth in my area of agricultural interest.

_____ 33. SOE helps me learn how to do skills needed in agricultural jobs.

_____ 34. SOE helps me in choosing an occupation.

_____ 35. SOE promotes a better relationship between me and my parents.

_____ 36. SOE helps me set goals for agricultural production.

_____ 37. SOE is an important part of the vo-ag program.

_____ 38. SOE is a way for me to grow into an off-farm agricultural job.

NAME_____ SCHOOL_____

SUPERVISED OCCUPATIONAL EXPERIENCES

ATTITUDE INVENTORY

Supervised occupational experience (SOE) programs are often called vo-ag projects, supervised farming programs, home projects, FFA projects, or similar terms. The following list of statements is NOT a test. There are no right or wrong answers. If you strongly disagree with the statement, write "1" on the line in front of the item. If you strongly agree, write "11" on the line. Use any number from 1 to 11. Please give your own opinion, and respond to each item.

1	2	3	4	5	6	7	8	9	10	11
Strongly disagree				Slightly disagree	Undecided	Slightly agree				Strongly agree

_____ 1. SOE helps me set career goals.

_____ 2, I can learn lots from my SOE program that I could not learn in the vo-ag classroom.

_____ 3. SOE helps me set educational goals.

_____ 4. SOE gives me a chance to use approved business procedures.

_____ 5. SOE benefits the community.

_____ 6. My agricultural interest is important to consider in selecting my SOE.

_____ 7. SOE promotes cooperation between my parents and my vo-ag teacher.

_____ 8. SOE helps me set goals for agricultural production.

_____ 9. SOE helps me earn money while still in school.

_____ 10. SOE helps me in choosing an occupation.

_____ 11. SOE lets me look in-depth in my area of agricultural interest.

_____ 12. SOE promotes the use of approved agricultural practices.

_____ 13. SOE develops my interests in agriculture.

_____ 14. SOE helps prepare me for an agricultural occupation.

_____ 15. SOE is important to all vo-ag students.

_____ 16. SOE promotes a better relationship between me and my parents.

_____ 17. SOE expands the vocational agriculture program.

1	2	3	4	5	6	7	8	9	10	11
Strongly disagree				Slightly disagree	Undecided	Slightly agree				Strongly agree

_____ 18. SOE helps me learn to work with others.

_____ 19. My interests in agriculture can be measured.

_____ 20. SOE is an important part of the vo-ag program.

_____ 21. My parents are important in helping me select my SOE.

_____ 22. SOE helps me learn to keep records.

_____ 23. My vo-ag teacher should help in supervising my SOE.

_____ 24. Long-range planning of my SOE is important.

_____ 25. SOE helps me get FFA degrees and awards.

_____ 26. Classwork, SOE, and FFA are all parts of a good vocational agriculture program.

_____ 27. SOE promotes a better relationship between me and my vo-ag teacher.

_____ 28. Planning my SOE is an important step in conducting an SOE program.

_____ 29. My vo-ag teacher is important in selecting my SOE.

_____ 30. Budgeting is important in planning my SOE program.

_____ 31. My experiences should be used in planning my SOE.

_____ 32. SOE helps me learn how to do skills needed in agricultural jobs.

_____ 33. SOE helps make my vo-ag class practical.

_____ 34. SOE is a way for me to grow into farming.

_____ 35. My parents are important in helping me plan my SOE.

_____ 36. My parents should help in supervising my SOE.

_____ 37. SOE is a way for me to grow into an off-farm agricultural job.

_____ 38. My vo-ag teacher should help me plan my SOE.

NAME _____ SCHOOL _____

PLANNING AND SELECTING AN SOE PROGRAM

The following are things you may or may not have done yet in selecting and planning your SOE program. Please answer the questions with a "Yes" or "No". This is NOT a test, and there are no right or wrong answers. Please answer truthfully and honestly.

HAVE YOU:

_____ 1. Identified your interests in agriculture?

_____ 2. Reviewed your previous agricultural experiences?

_____ 3. Studied the employment opportunities in agricultural occupations?

_____ 4. Determined land, facilities, and equipment available for your SOE?

_____ 5. Selected a way to finance your SOE?

_____ 6. Discussed your plans for an SOE program with your parents?

_____ 7. Reviewed the vocational agriculture department's requirements for SOE?

_____ 8. Reviewed the way your SOE will be evaluated?

_____ 9. Selected productive agriculture enterprise(s) or identified a place of employment in agriculture?

_____ 10. Identified improvement projects to be included in your SOE?

_____ 11. Identified agricultural skills you plan to develop?

_____ 12. Developed a budget for each of your crop and/or livestock enterprises?

_____ 13. Made month-by-month plans for each of your crop and/or livestock enterprises?

_____ 14. Prepared an agreement for your SOE program?

_____ 15. Set goals for productive agriculture enterprises?

TEACHERS' DEMOGRAPHIC DATA

Please answer each of the questions with an "X" or fill in the blank provided. Be as accurate as possible and please respond to all questions.

1. How many years have you taught high school vocational agriculture? (Count this year as one.)

   a. Totally _____; b. In your present school _____.

2. What is your age? _____ years

3. Did you take vocational agriculture in high school?
   ____ (1) Yes
   ____ (2) No

4. Were you originally from this county, a neighboring county, this general part of Iowa (NW, NE, SW, SE, NC, SC) or another state?
   ____ (1) Out-of-state
   ____ (2) Iowa
   ____ (3) This part of Iowa
   ____ (4) Neighboring county
   ____ (5) County

5. How many years of agriculture experience have you had after 12 years of age?
   a. _____ years farm experience (including growing up on a farm)
   b. _____ years agricultural business or agricultural industry experience

6. What is the highest degree you hold?
   ____ (1) B.S.
   ____ (2) M.S.
   ____ (3) Other (specify) _____

7. What type of teaching certificate do you hold?
   ____ (1) Permanent professional
   ____ (2) Professional
   ____ (3) Temporary
   ____ (4) Other (specify) _____

8. How many day-school classes do you teach? _____

9. Did you take a college course that focused on supervised occupational experience programs for vocational agriculture students?
   ____ (1) Yes
   ____ (2) No

10. How many different day-school class preparations do you make? _____

11. What is the average number of students in the classes you teach? _____

12. How many total students do you have in your vo-ag classes? _____

13. In addition to teaching, what other kinds of part-time occupational involvement do you have? (Check all that apply.)
    ____ (1) None
    ____ (2) Farming
    ____ (3) Farm management
    ____ (4) Agribusiness
    ____ (5) Real estate
    ____ (6) Other (describe) _____

14. For which of the following departmental duties are you responsible? (Check all that apply.)
    ____ (1) FFA advisor
    ____ (2) Young farmers education
    ____ (3) Adult farmers education
    ____ (4) Combination young and/or adult farmers
    ____ (5) FFA alumni association
    ____ (6) Others (describe) _____

15. How many hours of young and/or adult farmer classes do you conduct each year?

    _____ hours

16. What is the enrollment in grades 9-12 in your school? _____

17. How many miles do you live from the school? _____ miles

18. What is the average distance to students' places of residence from the school?

    _____ miles

19. For which of the following duties are you responsible? (Check all that apply.)
    ____ (1) Homeroom
    ____ (2) Bus duty
    ____ (3) Activity duty (other than FFA advisor)
    ____ (4) Study hall
    ____ (5) Athletic duty (ticket taker, crowd control, etc.)
    ____ (6) Lunch room duty
    ____ (7) Other (describe) _____

20. Do you have an active advisory council for your day-school vocational agriculture program?
    ____ (1) Yes
    ____ (2) No

21. Which of the following facilities do you have at your school for use by students to conduct SOE programs? (Check all that apply.)
    ____ (1) School farm
    ____ (2) Greenhouse
    ____ (3) Animal facilities
    ____ (4) Others (describe) _____

22. Do you assist with county fairs and livestock shows?
____ (1) Yes
____ (2) No

23. What percentages of students' beginning vocational agriculture course grades depends on their supervised occupational experience programs?

_____ %

24. How many teaching days do you normally spend with your beginning vo-ag class(es) on selecting and planning SOE programs?

_____ days

25. How many teaching days did you spend with this year's beginning vo-ag class(es) on selecting and planning SOE programs?

_____ days

26. Do you have written guidelines, requirements, rules, standards, etc., for student SOE programs?
____ (1) Yes
____ (2) No

27. How many home visits do you normally make each year per beginning student?

_____

28. How many home visits have you made this year per beginning vo-ag student?

_____

29. Did you have a beginning parent-student meeting last year?
____ (1) Yes
____ (2) No

30. Did you have a beginning parent-student meeting this year?
____ (1) Yes
____ (2) No

INFORMED CONSENT FORM

Informed Consent of Teacher

I voluntarily agree to participate in the activities associated with the study of supervised occupational experience programs in my vocational agriculture class. I further understand that the information which I provide will be held in confidence and that my responses will be combined with other responses and used only in the interest of improving instruction in vocational agriculture.

_____ (Date)

_____ (Signature of Teacher)

_____ (School)

APPENDIX E: ITEMS AND WEIGHTED VALUES USED IN DEVELOPING SOE PROGRAM PLANNING INSTRUMENTS

Iowa State University of Science and Technology Ames, Iowa 50011

Department of Agricultural Education
223 Curtiss Hall
Telephone 515-294-5872

Date: July 14, 1977

To:

From: Gary E. Briers, Instructor
David L. Williams, Associate Professor

We are attempting to identify items which would indicate that beginning vocational agriculture students have selected and planned their SOE Programs. Your help is needed to identify these indicators. This information will be used in an Iowa Agriculture Experiment Station study of SOE programs of beginning vocational agriculture students.

Instructions: The items listed below are possible indicators that a student has selected and planned properly his/her SOE program. Please indicate the degree of importance you would attach to each of the items as an indicator of good student planning of his/her SOE. Please respond to each item using the following scale:

1	2	3	4	5	6	7	8	9
Little or No Importance				Average Importance				Much Importance

Weighted values (mean ratings)

6.00 1. Identification of your interests in agriculture.

3.80 2. Appraisal of previous agricultural experiences.

4.80 3. Identification of opportunities in agricultural occupations.

6.60 4. Inventory of available land, facilities, and equipment for SOE.

6.20 5. Identification of financing of SOE.

7.80 6. Student's discussion with parents about SOE.

5.80 7. Awareness of departmental guidelines and standards for SOE.

5.40 8. Awareness of evaluation methods and criteria for SOE.

8.20 9. Productive enterprise(s) selected or place of employment identified.

6.60 10. Improvement projects selected.

5.80 11. Agricultural skills selected.

7.20 12. Budget prepared.

OVER

Weighted values (mean ratings)

7.60 13. Production or training plans developed.

8.00 14. Agreement made between student, parents, teacher, employer, others.

6.20 15. Goals established for productive enterprises.

PLEASE RETURN TO:

Gary E. Briers, Instructor
Agricultural Education Department
223 Curtiss Hall
Iowa State University
Ames, Iowa 50011

GEB:mji

APPENDIX F: ITEM OR FACTOR ANALYTIC RESULTS--INDIVIDUAL ITEMS OF SOE KNOWLEDGE INVENTORY, SOE ATTITUDE SCALE, AND SOE PROGRAM PLANNING INVENTORY

Table F-1. Item analysis of SOE Knowledge Inventory

Difficulty		Item number		Discriminating power	
Pretest	Posttest			Pretest	Posttest
.418	.720	1[ac]	(12)[bc]	.423	.313
.554	.614	2	(29)	.259	.299
.301	.446	3	(30)	.214	.344
.329	.601	4	(5)	.141	.378
.395	.526	5	(20)	.376	.371
.711	.920	6	(28)	.490	.170
.428	.640	7	(2)	.199	.255
.624	.762	8	(15)	.387	.423
.754	.793	9	(9)	.255	.232
.687	.688	10	(26)	.420	.357
.749	.889	11	(3)	.350	.236
.775	.899	12	(17)	.329	.204
.743	.806	13	(22)	.350	.287
.367	.541	14	(18)	.226	.266
.783	.902	15	(27)	.367	.198
.573	.588	16	(16)	.136	.260
.580	.648	17	(14)	.301	.393
.399	.521	18	(24)	.173	.185
.466	.523	19	(10)	.264	.294
.757	.790	20	(25)	.366	.320
.644	.808	21	(6)	.345	.344
.792	.769	22	(4)	.309	.427
.365	.611	23	(8)	.338	.377
.773	.855	24	(11)	.154	.183
.354	.547	25	(21)	.124	.296
.367	.417	26	(19)	.247	.207
.705	.819	27	(1)	.116	.332
.682	.666	28	(7)	.238	.480
.415	.484	29	(23)	.237	.199
.762	.754	30	(13)	.356	.325

[a]Item number on posttest form of SOE Knowledge Inventory.

[b]Item number on pretest form of SOE Knowledge Inventory.

[c]Identical items were used on both the pretest and posttest forms. The order, however, was randomly and independently determined for each form.

Table F-2. SOE Attitude Scale

Item number	Pretest		Posttest	
	Mean	S.D.	Mean	S.D.
1[ac] (19)[bc]	10.37	3.46	11.61	3.26
2[ac] (18)[bc]	10.69	3.59	11.12	3.45
3[ac] (6)[bc]	10.42	3.64	10.47	3.11
4[ac] (3)[bc]	10.40	3.42	10.58	2.84
5[ac] (27)[bc]	9.06	3.69	9.53	3.29
6[ac] (29)[bc]	12.31	3.48	12.92	3.39
7[ac] (21)[bc]	9.47	3.57	10.80	3.41
8[ac] (36)[bc]	10.95	3.36	11.77	3.10
9[ac] (8)[bc]	11.71	3.88	12.47	3.43
10[ac] (34)[bc]	10.46	3.68	10.98	3.44
11[ac] (32)[bc]	10.84	3.33	11.07	3.19
12[ac] (23)[bc]	10.72	3.21	11.05	3.03
13[ac] (13)[bc]	11.55	3.55	11.42	3.26
14[ac] (24)[bc]	11.63	3.50	11.99	3.18
15[ac] (20)[bc]	9.33	4.03	10.57	3.96
16[ac] (35)[bc]	9.05	4.12	9.66	3.85
17[ac] (11)[bc]	11.40	3.28	11.77	3.26
18[ac] (14)[bc]	11.05	3.41	10.74	3.24
19[ac] (1)[bc]	10.51	3.51	9.26	4.34
20[ac] (37)[bc]	11.47	3.56	11.73	3.41
21[ac] (4)[bc]	10.85	4.25	11.46	4.10
22[ac] (12)[bc]	11.95	3.43	12.35	3.26
23[ac] (17)[bc]	10.76	3.69	11.43	3.67
24[ac] (22)[bc]	10.41	3.35	11.28	3.41
25[ac] (7)[bc]	10.35	3.91	11.02	3.67
26[ac] (15)[bc]	12.84	3.50	12.62	3.59
27[ac] (10)[bc]	9.92	3.29	10.70	3.74
28[ac] (30)[bc]	11.36	3.34	11.85	3.09
29[ac] (9)[bc]	9.05	4.04	9.18	4.05

[a]Item number on posttest form of SOE Attitude Scale.

[b]Item number on pretest form of SOE Attitude Scale.

[c]Identical items were used on both the pretest and posttest forms. The order, however, was randomly and independently determined for each form.

Table F-2. Continued

Item number	Pretest		Posttest	
	Mean	S.D.	Mean	S.D.
30[ac] (28)[bc]	12.00	3.37	12.28	3.11
31[ac] (2)[bc]	11.14	3.77	11.96	3.33
32[ac] (33)[bc]	11.57	3.36	11.92	3.17
33[ac] (26)[bc]	10.07	3.31	10.38	3.26
34[ac] (16)[bc]	11.94	3.53	12.13	3.37
35[ac] (31)[bc]	10.90	3.82	11.70	3.78
36[ac] (25)[bc]	10.99	3.91	11.68	3.61
37[ac] (38)[bc]	9.49	3.98	9.50	3.91
38[ac] (5)[bc]	10.53	3.68	10.39	3.76

Table F-3. SOE Attitude Scale factor analysis

Item number	Pretest factor loadings			Posttest factor loadings		
	Factor 1	Factor 2	Factor 3	Factor 1	Factor 2	Factor 3
1[ac] (19)[bc]	0.45	0.38	0.20	0.56	0.27	0.16
2[ac] (18)[bc]	0.20	0.44	0.22	0.45	0.14	0.19
3[ac] (6)[bc]	0.48	0.22	0.09	0.54	0.37	0.07
4[ac] (3)[bc]	0.34	0.31	0.18	0.51	0.27	0.14
5[ac] (27)[bc]	0.34	0.09	0.22	0.31	0.29	0.13
6[ac] (29)[bc]	0.18	0.70	0.21	0.55	0.11	0.40
7[ac] (21)[bc]	0.29	0.23	0.41	0.43	0.37	0.35
8[ac] (36)[bc]	0.57	0.40	0.15	0.68	0.26	0.32
9[ac] (8)[bc]	0.35	0.29	0.21	0.53	0.10	0.18
10[ac] (34)[bc]	0.55	0.26	0.18	0.60	0.32	0.11
11[ac] (32)[bc]	0.49	0.44	0.33	0.67	0.28	0.26
12[ac] (23)[bc]	0.40	0.52	0.19	0.63	0.23	0.27
13[ac] (13)[bc]	0.61	0.18	0.25	0.59	0.25	0.22
14[ac] (24)[bc]	0.46	0.50	0.17	0.69	0.24	0.10
15[ac] (20)[bc]	0.45	0.16	0.17	0.48	0.30	0.12
16[ac] (35)[bc]	0.28	0.19	0.42	0.42	0.25	0.27
17[ac] (11)[bc]	0.47	0.33	0.13	0.56	0.24	0.28
18[ac] (14)[bc]	0.61	0.12	0.18	0.42	0.38	0.21
19[ac] (1)[bc]	0.06	0.06	0.19	0.12	0.30	0.05
20[ac] (37)[bc]	0.53	0.44	0.16	0.63	0.32	0.19
21[ac] (4)[bc]	0.10	0.23	0.56	0.20	0.19	0.69
22[ac] (12)[bc]	0.50	0.43	0.13	0.62	0.16	0.38
23[ac] (17)[bc]	0.33	0.17	0.40	0.33	0.47	0.43
24[ac] (22)[bc]	0.32	0.43	0.11	0.54	0.26	0.34
25[ac] (7)[bc]	0.48	0.14	0.21	0.47	0.26	0.23
26[ac] (15)[bc]	0.50	0.30	0.16	0.54	0.22	0.35
27[ac] (10)[bc]	0.48	0.11	0.34	0.47	0.49	0.24
28[ac] (30)[bc]	0.29	0.57	0.11	0.62	0.27	0.26
29[ac] (9)	0.24	0.00	0.53	0.14	0.66	0.20

[a]Item number on posttest form of SOE Attitude Scale.

[b]Item number on pretest form of SOE Attitude Scale.

[c]Identical items were used on both the pretest and postest forms. The order, however, was randomly and independently determined for each form.

Table F-3. Continued

Item number	Pretest factor loadings			Posttest factor loadings		
	Factor 1	Factor 2	Factor 3	Factor 1	Factor 2	Factor 3
30[ac] (28)[bc]	0.33	0.48	0.17	0.55	0.06	0.36
31[ac] (2)[bc]	0.16	0.50	0.22	0.54	0.09	0.29
32[ac] (33)[bc]	0.51	0.42	0.27	0.71	0.31	0.16
33[ac] (26)[bc]	0.42	0.28	0.22	0.42	0.47	0.16
34[ac] (16)[bc]	0.47	0.35	0.11	0.57	0.28	0.20
35[ac] (31)[bc]	0.05	0.41	0.58	0.21	0.24	0.73
36[ac] (25)[bc]	0.10	0.43	0.56	0.34	0.22	0.54
37[ac] (38)[bc]	0.53	0.44	0.16	0.27	0.38	0.06
38[ac] (5)[bc]	0.20	0.04	0.61	0.13	0.74	0.25

Table F-4. Summary of SOE Attitude Scale factor analysis

Pretest			
Factor	Eigenvalue	Percent of variation	Cumulative %
1	11.54	83.6	83.6
2	1.28	9.3	92.8
3	0.99	7.2	100.0

Posttest			
Factor	Eigenvalue	Percent of variation	Cumulative %
1	14.81	87.4	87.4
2	1.15	6.8	94.2
3	0.98	5.8	100.0

Table F-5. SOE Program Planning Inventory item analysis

Item number	"0, 1" categorization			"0, weighted categorization		
	Means	S.D.	r_{it}	Means	S.D.	r_{it}
1	0.83	0.37	0.43	4.98	2.26	0.43
2	0.72	0.45	0.42	2.73	1.71	0.42
3	0.47	0.50	0.24	2.26	2.40	0.23
4	0.73	0.34	0.45	4.80	2.94	0.23
5	0.64	0.48	0.53	3.95	2.99	0.54
6	0.79	0.41	0.43	6.13	3.20	0.43
7	0.53	0.50	0.37	3.09	2.90	0.35
8	0.45	0.50	0.44	2.44	2.69	0.42
9	0.72	0.45	0.35	5.94	3.67	0.35
10	0.76	0.43	0.49	4.98	2.84	0.49
11	0.75	0.43	0.44	4.35	2.51	0.44
12	0.43	0.50	0.57	3.08	3.57	0.58
13	0.41	0.50	0.35	3.11	3.74	0.36
14	0.46	0.50	0.53	3.69	3.99	0.54
15	0.69	0.45	0.53	4.27	2.88	0.54