

EXPERIMENTAL EVALUATION OF AN INSTRUCTIONAL
PACKET ON SUPERVISED OCCUPATIONAL EXPERIENCE PROGRAMS
FOR BEGINNING VOCATIONAL AGRICULTURE STUDENTS IN IOWA*

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The educational value of supervised occupational experience (SOE) as a component of instruction in vocational agriculture has been established through philosophical contemplation, empirical research, and historical review. 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 recommended procedure involves instruction on the "what, why, and how" of SOE (Miller, 1974). The primary responsibility for providing this instruction rests with the teacher of vocational agriculture (Magill, 1933).

A 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, which could provide the subject matter content and instructional techniques, thus reducing the preparation time needed by the teacher and insuring appropriate content. An instructional packet on SOE programs for beginning vocational agriculture students was developed at Iowa State University (Williams, 1977a) in an attempt to improve SOE programs of Iowa vocational agriculture students.

Development and distribution of instructional materials, however, is not enough. For example, Ridenour (1965), Gliem (1976), and Kaas (1976) advocated evaluation of instructional materials to determine their teaching-learning value. In other words, does the use of instructional materials cause desired behavioral changes in students? With this question in mind, a study of the SOE instructional packet was the main thrust of research completed at Iowa State University (Briers, 1978).

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Purpose of the Study

The primary purpose of the study was to determine the effectiveness of the instructional packet on SOE as evaluated by (a) student knowledge of SOE, (b) student attitude toward SOE, and (c) student SOE program planning. A secondary objective was to describe selected characteristics or situations of Iowa's beginning vocational agriculture students.

Methodology

Design and Sample

A pretest-posttest control group experimental design was used in the investigation. A sample of forty schools was randomly selected from the population, defined as those schools offering vocational agriculture in 1977-78 whose vocational agriculture instructors had taught in the school system during the 1976-77 school year. This definition eliminated all beginning teachers and those instructors who had changed positions between the two school years. The sample was divided randomly into two groups of 20 schools each; one group was assigned to the experimental treatment while the other schools served as the control. The experimental units, then, consisted of the beginning vocational agriculture classes while the individual students comprised the sampling units.

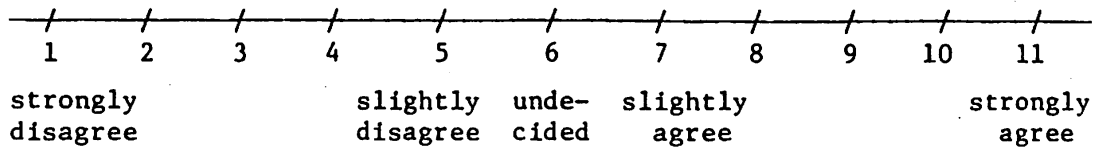
Dependent Variables and Instrumentation

Four instruments were developed to measure the dependent variables and to record personal and situational information from the students. The dependent variables measured and instrument development is described here.

Student Data Questionnaire. This instrument was administered pre-experiment to collect educational and occupational plans and situational data related to selecting and planning SOE programs in vocational agriculture.

SOE Knowledge Inventory. An objective test of 30 multiple-choice items with four alternatives each was used to assess each student's knowledge of SOE. Pretest and posttest forms of the inventory yielded reliability coefficients (coefficient alpha) of .776 and .842, respectively. The inventory was scored and reported on a percentage basis.

SOE Attitude Scale. To measure each student's attitude toward SOE, 38 statements about SOE were written by the project team. Students (research subjects) "answered" the statements according to the following response framework:



These response values were then assigned transformed values of "0" to "16" based on the "certainty method" (Warren, Klonglan, and Sabri, 1969). Factor analytic techniques revealed that the scale was unidimensional (85 percent of the variability in item scores was accounted for by one factor), item variances were homogeneous, and intercorrelations among scale items were positive and homogeneous. The reliability coefficient for the pre-experiment administration of the SOE Attitude Scale was .937 and the post-experiment was .957. These findings supported the procedure used in computing a summated attitude score. Again, the values reported in the findings are based on percentages of the total possible score.

SOE Program Planning Inventory. This inventory was developed to assess the "degree" to which students had selected and planned their individual SOE programs. Each of 15 statements describing an SOE planning activity was weighted on a 1 to 9 importance scale by a jury of teachers, supervisors, and teacher educators as an "indicator" of good SOE program planning. Then, questions that elicited "yes" (I have done this) or "no" (I have not done this) responses from the students were developed based on the original statements. The inventory, administered post-experiment, yielded a reliability coefficient of .818. Once more, a summated score was produced by adding the weighted values (jurors' mean importance scores) for "yes" responses of each student, and scores are again reported on a "percentage of total score possible" basis.

Description of Treatment Levels. The instructional packet and inservice education of vocational agriculture teachers on the use of the materials constituted the experimental treatment. Teachers assigned to the control group were not given the instructional packet. Rather, the teachers were asked to teach what they ordinarily would teach on SOE programs to their beginning students.

Collection of Data. Teachers in both the experimental and control treatment groups administered data collection instruments to their students. Pretest instruments were mailed to the teachers shortly before they began teaching their SOE units. They returned the completed instruments to the researcher for scoring. The same procedure was used to collect posttest data. Usable

data were obtained from 17 schools in the experimental treatment group and 16 of the control treatment group schools. A total of 387 student responses was received.

Analysis of Data. Because the characteristics and situations of the students were assessed by nominal variables, percentages were used to summarize the descriptive information. Analysis of variance served to measure the effectiveness of the instructional packet. The statistical design used in analyzing effects of the treatment of student knowledge of SOE and student attitude toward SOE was a two-factor experiment with one repeated measure (Winer, 1962). This model was used because it permitted analysis of responses by treatment group, analysis for difference between pretest and posttest responses, and analysis to determine if the magnitude of change of responses from pretest to posttest differed by treatment group (interaction of time and treatment group). Finally, one-way analysis of variance was used to test for differences between SOE program planning done by the control and experimental treatment groups.

Findings

Previous descriptive studies by Kahler (1970), Byler (1975), and Williams (1977b) on Iowa vocational agriculture students have shown a very production-oriented background. These studies, however, assessed only juniors and seniors. Table 1 describes the characteristics and situations of Iowa's 1977-78 beginning vocational agriculture students.

As found in similar studies of *older* Iowa vocational agriculture students, a large majority of *beginning* students came from strong production backgrounds. They lived in rural areas (86 percent) and their parents farmed (61 percent) or worked in agribusiness (11 percent). A smaller number (54 percent) of the students had at least *tentative* occupational plans of entering production agriculture jobs. Only a small percentage (14 percent) expressed plans to pursue agribusiness occupations. Finally, almost equal percentages of students planned to get additional formal education beyond high school from vocational schools (23 percent) and universities (26 percent) or to seek employment after graduation (26 percent self-employed, 25 percent as employees).

The assessment of the instructional packet 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. Both the SOE Knowledge Inventory and the SOE Attitude Scale were administered pre- and post-experiment, while the SOE Program Planning Inventory was given at the end of the experiment only.

Table 1

CHARACTERISTICS AND SITUATIONS OF BEGINNING VOCATIONAL
AGRICULTURE STUDENTS IN IOWA, 1977-78

Characteristic or Situation	Percentage*
Place of residence	
In town	14
Rural area, not a farm	10
On a farm	76
Father's or guardian's occupation	
Farmer	61
Other agriculture	11
Non-agriculture	28
FFA membership	
Yes	89
No	11
Occupational plans	
Production agriculture	54
Off-farm agriculture	14
Non-agriculture	21
Undecided	11
Immediate plans after graduation	
Attend vocational school or community college	23
Attend 4-year college or university	26
Work for yourself (self-employed)	26
Get a full-time job (including military service)	25

*n = 387 students from random sample of 33 schools.

The null hypotheses and the tests of hypotheses for the SOE Knowledge Inventory, SOE Attitude Scale, and SOE Program Planning Inventory are presented here.

SOE Knowledge Inventory hypotheses were:

- Ho₁: There is no difference between the combined pretest-posttest SOE knowledge scores for the experimental and control treatment groups.
- Ho₂: There is no difference between the pretest and posttest SOE knowledge scores (ignoring treatment groups).
- Ho₃: 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.

The SOE Attitude Scale hypotheses were:

- Ho₄: There is no difference between the combined pretest-posttest SOE attitude scores for the experimental and control treatment groups.
- Ho₅: There is no difference between the pretest and posttest SOE attitude scores (ignoring treatment group).
- Ho₆: There is no difference in the magnitude or change from the pretest to the posttest (SOE Attitude Scale) for the experimental and control treatment groups.

The SOE Program Planning Inventory hypothesis was:

- Ho₇: There is no difference between the SOE program planning scores for the experimental and control treatment groups.

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 on the SOE

Table 2

MEANS, STANDARD DEVIATIONS, AND F-RATIOS FOR
SOE KNOWLEDGE INVENTORY SCORES

Group	SOE Knowledge		F-ratio
	Mean	S.D.	
Experimental (combined pretest and posttest)	64.6	10.7	.62 ¹
Control (combined pretest and posttest)	62.2	8.2	
Pretest (combined treatment groups)	57.8	9.2	77.88* ²
Posttest (combined treatment groups)	68.8	9.6	
Experimental group pretest	57.7	10.7	3.32 ^{a2}
Experimental group posttest	71.1	10.6	
Control group pretest	57.9	7.8	
Control group posttest	66.4	8.5	

¹Test of Ho₁

²Test of Ho₂

³Test of Ho₃-interaction of treatment group and test administration

^aSignificant at .10

*Significant at .01

Table 3

MEANS, STANDARD DEVIATIONS, AND F-RATIOS FOR
SOE ATTITUDE SCALE SCORES

Group	SOE Attitude		F-ratio
	Mean	S.D.	
Experimental	70.1	7.7	2.63 ⁴
Control	66.6	5.1	
Pretest	67.5	6.9	4.46 ^{*5}
Posttest	69.4	6.8	
Experimental group pre- test	68.5	8.7	2.82 ⁶
Experimental group post- test	71.8	6.7	
Control group pretest	66.5	4.3	
Control group posttest	66.8	6.0	

⁴Test of Ho₄

⁵Test of Ho₅

⁶Test of Ho₆

* Significant at .05 level

Table 4

MEANS, STANDARD DEVIATIONS, AND F-RATIO FOR
SOE PROGRAM PLANNING INVENTORY SCORES

Group	SOE Program Planning		F-ratio
	Mean	S.D.	
Experimental	71.2	11.9	15.22 ^{*7}
Control	52.4	15.6	

⁷Test of Ho₇

* Significant at .01 level

Knowledge Inventory. 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.

Recommendations

Based on the findings of this study, the following recommendations warrant consideration by those responsible for the administration, supervision, and operation of vocational agriculture programs and the preservice and inservice education of vocational agriculture teachers:

1. The rural background and preference for production agriculture occupations indicate emphasis on supervised farming programs as the dominant type 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. The SOE Knowledge Inventory, the SOE Attitude Scale, and the SOE Program Planning Inventory may serve as valid and reliable measures of SOE knowledge, attitude and planning, respectively.
6. Instruction on SOE to beginning vocational agriculture students should continue to be provided.
7. 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. (The original packet has been revised and published. The materials are available from IAVIM, 208 Davidson, Ames, Iowa 50011.)

8. 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.

References

- Briers, Gary E. *An Experimental Evaluation of an Instructional Packet on Supervised Occupational Experience Programs for Beginning Vocational Agriculture Students in Iowa*. Ph.D. Thesis. Ames: Iowa State University, 1978.
- Byler, Bennie L. *Analysis of Factors Related to the Educational Plans of Iowa Vocational Agriculture Students*. Ames: Department of Agricultural Education, Iowa State University, 1975.
- Gliem, Joseph A. *Effectiveness of a Student Reference in Teaching Safety to High School Vocational Agriculture Students*. Ph.D. Thesis. Ames: Library, Iowa State University, 1976.
- Kaas, Duane A. *Comparisons of Alternative Methods of Teaching Plant Material Identification in Selected Schools of Iowa*. Ph.D. Thesis. Ames: Library, Iowa State University, 1976.
- Kahler, Alan A. *An Experimental Evaluation of the Effectiveness of Selected Techniques and Resources on Instruction in Vocational Agriculture*. Ames: Iowa State University, 1970.
- Magill, Edmund G. "Planning Supervised Farm Practice." *Agricultural Education Magazine*, 1933, page 57-58.
- Miller, Texton R. "Supervised Occupational Experience--Content for Group Instruction." *Agricultural Education Magazine*, 1974, page 147-148.
- Ridenour, Harlan E. *Guidelines for Organizing and Operating a State Vocational Agriculture Curriculum Materials Service*. Ph.D. Thesis. Columbus: Library, The Ohio State University, 1965.
- Warren, Richard D., Klonglan, Gerald E., and Sabri, Medhat M. *The Certainty Method: Its Application and Usefulness in Developing Empirical Measures in Social Sciences*. Rural Sociology Report No. 82. Ames: Department of Sociology and Anthropology, Iowa State University, 1969.

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