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AUTHOR	Hamilton, Jack A.; Claudy, Carolyn B.
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ABSTRACT

A program for trained vocational education curriculum specialists (VECS), consisting of 16 modules, was written, revised, and field tested at 15 sites nationwide. The instructional materials were written to deliver the highest rated competencies based on a field survey of vocational educators and review by a national advisory panel of vocational education experts. VECS modules were designed to create or upgrade an individual's vocational education curriculum development and management skills. Additional materials developed were a guide for instructors and administrators and audio cassette tape for orienting potential users. For the field test a modified quasi-experimental, pretest/posttest, treatment group/control group design was used. Participants were undergraduates in vocational education teacher preparation, practicing vocational educators, and persons with occupational skills who wished to teach their specialty at 12 colleges/universities and two state departments of education. Field test evaluation forms were developed to measure cognitive and affective outcomes and to collect biographical information. Results of the national field test demonstrated that the modules increased knowledge of topics necessary to the successful performance of skills central to the VECS role. They also tended to increase peoples' confidence in their ability to perform these skills. (A list of materials produced is appended; a summary report is available as CE 031 802.) (YLB)

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AMERICAN INSTITUTES FOR RESEARCH
IN THE BEHAVIORAL SCIENCES
P.O Box 1113, 1791 Arastradero Rd Palo Alto Ca 94302 ● 415/493-3550

FINAL TECHNICAL REPORT

FIELD TESTING VOCATIONAL EDUCATION

CURRICULUM SPECIALIST MATERIALS

Jack A. Hamilton

Carolyn B. Claudy

30 September 1981

Discrimination Prohibited - Title VI of the Civil Rights Act of 1964 states: "No person in the United States, shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance." Therefore, the Vocational Education program, like all other programs or activities receiving financial assistance from the Department of Education, must be operated in compliance with this law.

The project presented herein was performed pursuant to Contract No. 300-78-0562 from the U.S. Department of Education, Office of Vocational and Adult Education. However, the opinions expressed herein do not necessarily reflect the position or policy of the U.S. Department of Education, and no official endorsement by the U.S. Department of Education should be inferred.

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Frances Hamilton of the Office of Vocational and Adult Education (OVAE) served as the initial U.S. Department of Education (ED) Project Officer. She deserves credit for drawing up the original work statement and for working closely with the project team during the first year of the project. Muriel Tapman of OVAE functioned as the ED Project Officer during most of the remaining two years of the project. She was responsible for many of the insights and refinements that added so much to the final results. Deborah Newkirk of OVAE provided able assistance in the final months of the project.

Our external advisory panel included Ralph Bohn, Don Clark, Bill Daniels, Rebecca Douglass, Linda Glosson, Addison Hobbs, Marion Warner Holmes, Roslyn Kane, Bob Patton, and Hollie Thomas. As representatives of the "real world," they kept us in mind of the needs and concerns of those who carry out the curriculum development functions in vocational education.

The site coordinators of field test activities--Jim Bikkie, Bill Blank, Dick Bortz, Joe Clary, John Cummings, Don Elson, John Glenn, Katy Greenwood, Mildred Johnson, Webb Jones, Ruth Martin, Bruce McDonald, Bob Patton, Hal Polk, and John Sellers--were all extremely helpful in working with us.

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specialist training programs. In 1974, the Bureau of Occupational and Adult Education (BOAE) awarded contracts to the American Institutes for Research (AIR) and to Washington State University (WSU) to produce, test, and revise such materials. In 1978, BOAE again contracted with AIR to conduct a national field test of the VECS materials. The overall goal of this project was to integrate the original two sets of materials, systematically field test them, and encourage their use in the field.

In designing the first sets of materials, careful analyses of the competencies required of a VECS were conducted based on a field survey of vocational educators and a review by a national advisory panel of vocational education experts. The instructional materials were written to deliver the highest rated competencies. The resulting materials were pilot tested at five universities by an independent third-party evaluator, and subsequently revised. AIR assumed that the competency base for the first sets of VECS materials was sound. Thus, efforts in the national field test concentrated on integrating and updating the first AIR and WSU materials and on assuring that the resulting materials were appropriate for use in a wide variety of settings with varied target populations. Efforts in this third revision cycle prior to the national field test improved strategies for presenting information, added learning activities and support materials, eliminated overlap and redundancy, and focused on current national priorities regarding sex equity and training for handicapped and older students. Based on suggestions from instructors, students, and consultants collected during the national field test, the modules were again revised and improved.

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Purpose of the Modules

The VECS modules were designed to create or upgrade an individual's vocational education curriculum development and management skills. These skills enable the curriculum specialist to: (1) describe current issues in vocational education funding and governance; (2) design or modify vocational education programs to provide for individual differences, meet the needs of special students, or meet labor market demands; (3) select curricular approaches, goals and objectives, and instructional strategies for vocational education programs; (4) prepare instructional materials; (5) conduct evaluations of vocational curricula; (6) manage a vocational classroom or program; (7) facilitate curriculum change; and (8) promote professional growth and staff development.

Description of the Modules

Since the VECS modules are intended to serve a broad purpose, their design had to be highly flexible. They synthesize an extensive amount of information into a concise format that is organized to promote efficient learning under a variety of circumstances. The titles of the VECS modules are shown in Table I. They can be divided into three series of approximately equal length. The goal of the introductory series is to provide an historical background of the development of vocational education, present an overview of its scope, organization, and priorities, and describe the role and functions of the vocational education curriculum specialist. The second series covers topics directly related to the preparation of instructional materials. Its goals are to teach vocational needs assessment and task analysis, specification of objectives, selection of instructional strategies, assessment of student achievement, and the selection or development

of curriculum materials. The final series is designed to provide the curriculum specialist with administrative skills. These modules are concerned with evaluation, program management, curriculum innovation, and staff development.

TABLE I

VECS Module Titles

Introductory Series	1.	Vocational Educators and Curriculum Management
	2.	The Scope of Vocational Education
	3.	Organization of Vocational Education
	4.	Legislative Mandates for Vocational Education
	5.	Priorities in Vocational Education
	6.	Vocational Education for Students with Special Needs
Curriculum Development Series	7.	Vocational Needs Assessment and Curriculum Development
	8.	Conducting Task Analyses and Developing Instructional Objectives
	9.	Selecting Instructional Strategies and Assessing Student Achievement
	10.	Relating Learning Differences and Instructional Methods
	11.	Selecting and Preparing Instructional Materials
Administrative Series	12.	Evaluating Vocational Education Curricula
	13.	Conducting Follow-Up Studies and Communicating Evaluation Results
	14.	Managing Vocational Education Programs
	15.	Preparing for Curriculum Change
	16.	Staff Development

Modules average about 75 pages in length and require about 30 to 50 hours to complete. They follow a standard format including a detailed list of behavioral goals and objectives, and text, learning activities, and self-assessment items related to each goal. The modules usually contain from three to five goals each. Learning activities include reading in published resources, group projects, and discussion questions. Interviews with vocational educators and actual practice in curriculum development skills are frequently called for. The whole set of modules can be instituted as the foundation of a formal curriculum specialist training program

or selected groups of modules can serve as the focus of specific courses. In addition, components of modules, individual modules, or series of modules can be integrated into existing courses or programs. Because the modules are organized around spetific goals and include alternative learning activities, their use is appropriate in traditional and nontraditional classrooms, inservice education programs, and independent study.

Additional Materials

Using the VECS modules: A guide for instructors and administrators was written to help vocational educators set up and manage professional development programs that focus on curriculum skills. The Guide presents instructional strategies appropriate for the many different situations in which the modules can be used. General guidelines, specific suggestions, and ideas to stimulate creativity are based on the experiences of field test instructors. The Guide identifies courses and programs into which the modules might be incorporated, describes how faculty might be encouraged to try them, and discusses steps in planning and initiating a new curriculum specialist training program. A list of the resources for each module that should be ordered from their respective publishers is included.

An audio cassette tape was also developed for orienting potential users to the VECS modules. The tape presents interviews with field test instructors and site coordinators who offer their advice on module implementation.

Chapter II

FIELD TEST OF THE MATERIALS

Study of the VECS modules produces significant gains in knowledge of the history and philosophy of vocational education and topics in vocational education curriculum development, management, and evaluation. Use of the modules also increases students' self-perception of personal competence in activities performed by a VECS.

Field Test Design

A modified quasi-experimental, pretest/posttest, treatment group/control group design was used. The design featured multiple replications with different types of students using various patterns of module implementation and methods of teaching. The field test was conducted under the types of conditions expected to represent actual module use, which precluded the type of control needed to carry out a scientifically rigorous research design.

Sites were selected based on the appropriateness of the setting and the student population, and on their willingness to cooperate in the field test. A local coordinator at each site identified instructors and students to serve in the treatment and control groups. An AIR staff member conducted orientation sessions at each site. For the most part, intact classes were used, and instructors taught the modules following the general guidelines established during the orientation session. Student participants were not paid. To maximize the likelihood of obtaining usable data, field test data collection instruments were kept short and administered to

control students only one time. Because of the "naturalistic" character of the field test, site coordinators and AIR staff could not exercise strict control over the schedule of module use, the method of module implementation, or the selection and testing of treatment and control groups.

TABLE II

Module Groups

	Number of Modules*	Topics
Group 1	5	history and philosophy of vocational education
Group 2	5	vocational education curriculum development
Group 3	2	procedures for individualizing curricula for special students
Group 4	5	evaluation and administration of vocational education

*After the field test, modules in Group 3 were divided between Groups 1 and 2 resulting in the three series of modules described earlier. One module in Group 2 was deleted and its significant content was integrated into several of the other modules, resulting in the final total of 16 modules.

For purposes of the analysis, the modules were divided into four groups as shown in Table II. Module groups 1 and 2 were taught in the fall of 1979. All module groups were taught during the winter and spring of 1980, although groups 3 and 4 were emphasized. Typically, students studied three to five modules each. Treatment students were tested both before and after they studied the particular modules taught in their classes. Control students were tested only once. At some sites, controls were tested when treatment students were pretested; at other sites, when treatment students were posttested. The test results of only those students who studied all modules in a group and took both a pretest and a posttest were used in the analysis. Separate t-tests were calculated for each module group.

Field Test Sites and Participants

The sponsors of the 15 VECS field test sites included twelve colleges or universities and two state departments of education. Five of the educational institutions held classes on campus, six used off-campus locations such as area vocational schools, and one university sponsored two sites, one on campus and one at a military base. VECS instructors were most often faculty, but also included a director of a regional occupational program, a principal of an area vocational school, and a director of a state curriculum and instructional materials center.

Students who participated in the field test included: (1) undergraduates preparing to be vocational education teachers; (2) practicing vocational education teachers, administrators, counselors, and curriculum developers; and (3) persons with occupational skills developed in business or the military who wished to teach their specialty. Students' goals included obtaining a state vocational teaching certificate, a college degree at the undergraduate or graduate level, and inservice professional development. Weekly classes, held during the day, at night, or on weekends, were the main instructional delivery method, although several students took the modules through independent study arrangements. Class sizes ranged from over 30 to under 10.

Table III summarizes information on the field test sites and participants who supplied the data reported here. Data from all sites and all participants are not reported due to the decision to base the analysis on results from only those students who studied all modules in a group.

TABLE III

Field Test Sites and Participants

Sponsor	Location: on or off campus	Purpose of Institution: Preservice (P) or Inservice (I)	Student Characteristics	Number of Students Who Contributed Data to the Analysis, by Module Group			
				Group 1	Group 2	Group 3	Group 4
1. University of Idaho	off	I	Vocational teachers	5	4	7	7
2. Washington State University	on	P	Future vocational teachers	--	--	--	--
3. California State University, Sacramento	off	P	Occupational specialists	--	8	11	--
4. Virginia Polytechnic Institute and State University	off	I	Secondary and postsecondary teachers	10	8	--	--
5. Southern Illinois University, Carbondale	on	P	Occupational specialists and future business education teachers	--	25	--	9
6. Oklahoma State Department of Vocational and Technical Education	N/A	I	Staff of curriculum and instructional materials center	7	6	18	18
7. Oklahoma State University	on	I	Vocational teachers	4	5	10	10
8. Southern Illinois University, Carbondale at Travis Air Force Base	off	P	Military occupational specialists	23	--	--	--
9. University of South Florida	off	I	Vocational teachers, supervisors, and administrators	--	--	--	--
10. New Jersey Department of Education	N/A	I	Vocational teachers, coordinators, and guidance counselors	--	--	--	--
11. SUNY College of Technology, Utica/Rome	on	P & I	Graduate students with vocational-technical backgrounds	2	--	--	--
12. University of North Carolina, Greensboro	on	I	Home economics teachers	5	13	--	--
13. North Carolina State University	on	I	Teachers and state department administrators	11	2	--	--
14. Texas A & M University	off	I	Vocational teachers, administrators, and counselors	16	10	7	8
15. East Texas State University	off	I	Vocational teachers and administrators	26	12	17	32
				109	93	70	84

Measurement of Effect

Specially constructed instruments for use in the field test were developed to estimate the effectiveness of the VECS modules. Field test evaluation forms (FTEFs) measured the cognitive and affective outcomes of module study and collected biographical information on treatment and control students. The FTEFs provided information on the overall effect of studying groups of modules. They were not designed to test mastery of each objective of each module goal. Effects of module groups 1 and 2 were assessed by one set of FTEFs, while module groups 3 and 4 were tested by another set.

The FTEFs had six sections, each designed to collect a different kind of information. One section requested background information on education, current occupation, and previous work experience. Another section provided a checklist on which respondents indicated recent professional development experiences. Two sections requested participants to rate themselves on twelve activities that are typical of the VECS role. The first self-rating was of a person's competence in performing the activities; the second was of a person's desire to engage in the activities. Competence self-ratings ranged from 1-6; attitude self-ratings ranged from 1-4.

The remaining two sections contained multiple-choice and short-answer items based on significant cognitive outcomes of the modules. In order to reduce response burden and increase the number of people who might respond, the number of items included on any one FTEF was severely restricted. Only one, four-alternative, multiple-choice question was included for each goal of each module included in the group of modules tested by a form. The set

of FTEFs testing module groups 1 and 2 contained 37 multiple-choice items; FTEFs for module groups 3 and 4 contained 23 multiple-choice items. Two sets of parallel multiple-choice items were written for each module group. Treatment students took one set of items as a pretest and the other set as a posttest. In order to control for possible differences in the difficulty of the two parallel sets, one set was used as a pretest at about half the sites, while the other set was included in the pretest at the remaining sites. About half the control pretests and half the control posttests contained each set of multiple-choice items, as well.

One short-answer item was written for each of the modules in groups 2-4. As these items were intended to assess cognitive prerequisites of the performance of skills central to the VECS role, no short-answer items were included to test outcomes of the group 1 modules because these modules provide background information and do not focus on skills. The short-answer skill items required students to list such things as the appropriate procedures for certain situations, the sequential steps in a procedure, or the advantages and disadvantages of several alternative procedures. Responses were rated on a scale of 1-5 based on pre-specified criteria that reflected the quality of the response in terms of its accuracy and completeness.

Short-answer items were not included in the FTEFs administered to control group students. Because the short-answer items were so directly related to the content of the modules, it was felt that asking control students to answer them without the benefit of module study would be excessively burdensome in relation to the value of the data that would be obtained.

Interpretability of Measures

The FTEFs were prepared according to a careful, step-by-step development process, and were approved by the Federal Education Data Acquisition Council (FEDAC), the group charged with ensuring that data are collected by the most efficient and effective means. The statements of VECS' activities used in the self-assessments of competence and attitude were derived from the content of the modules, which was in turn derived from the detailed competency analysis performed prior to the writing of the initial set of modules. The multiple-choice and performance items were written based on objectives and topics the modules' authors considered most significant. Each item was reviewed by the module's author for content accuracy and by the project's evaluation director for technical adequacy. Items were then revised as many times as necessary.

The multiple-choice items were pilot-tested. Respondents answered, critiqued, and edited the items. Point-biserial correlations and difficulty levels were calculated for each item. Items with low correlations or very high or very low difficulty levels were removed or improved. An attempt was made to balance difficulty levels of multiple-choice item sets when constructing the alternative forms of the FTEFs. However, we could not obtain clear evidence that parallel multiple-choice item sets were of equal difficulty. Therefore, cases were dropped randomly from the analysis so that equal numbers or proportions of people in the groups compared took each set of items.

Spearman-Brown estimates of the split-half reliabilities of the two parallel multiple-choice item sets were calculated for each of the four

module groups. The resulting eight correlations ranged from .12 to .55 with approximately .40 the mode and .33 the mean. Two decisions made in designing the FTEFs operated against obtaining high reliability estimates. First the number of multiple-choice items included on any one form was deliberately kept low. The numbers of items for module groups 1-4 (see Table II) were 17, 20, 7 and 16 respectively. The Spearman-Brown reliability estimate for a 60-item test with the same split-half correlation as the 17 items written for module group 1 would be effectively double the actual estimate obtained. The second decision operating against obtaining high reliability estimates concerned using one set of items to test the content of a number of modules. The items testing a group of modules did not include interchangeable measures of the same learning, and since the Spearman-Brown statistic essentially is a measure of internal consistency, a high reliability estimate could not be expected.

Despite the low reliabilities calculated for the multiple-choice items, two points should be kept in mind. First, the content of the test items was judged valid by the module authors and the project director, those persons most familiar with the concepts the modules were designed to each. Second, the FTEFs were the only instruments available to assess the effects of the modules. No standardized tests existed that measured the goals of these modules in a systematic manner.

Credibility of Evidence

An attempt was made to ensure that scoring and analysis was done objectively and reliably. While the tests that provided the data upon

which this submission is based were administered by the teachers of treatment and control students in their classrooms, the completed tests were sent directly to AIR where objective methods were employed for scoring. Data were coded and keytaped by clerical staff who knew little about the nature of the field test. Computer services staff of AIR, rather than project staff, analyzed the data by using standard statistical packages.

Chapter III

RESULTS OF THE FIELD TEST

The main effects claimed for the VECS modules are cognitive and the claims rest on the results obtained on the multiple-choice and short-answer items. The cognitive effects are reinforced by an affective outcome revealed in the self-ratings of competence. The assertion of the effectiveness of the VECS modules is based primarily on the comparison of the pretest and posttest results of students who studied the modules. Although some treatment group/control group analyses were performed and are reported, they are included in this submission as secondary support for the assertion.

Treatment group pretest/posttest comparisons are appropriate for showing that newly developed instructional materials do, in fact produce the kind of results for which they were designed. For the VECS field test, control group data were not intended to demonstrate that the modules are more effective than a competing treatment (there is none), but rather to indicate that factors other than module study occurring during the course of the field test were unlikely to have produced the obtained results. Factors in the design of the field test that are discussed later, as well as the control group data, indicate it is likely that the field test results were indeed produced by module study.

Data Analysis and Results

In preparation for the analysis, several summary scores were created. Module group scores on multiple-choice items were calculated for control students, and for treatment students who studied all modules in a group.

Similar scores for treatment students were created for short-answer items. (As discussed earlier, control students' FTEFs did not contain short-answer items.) Summary scores were created for the self-ratings of competence and attitude by adding together the ratings made on each of the 12 activity statements. The total number of professional development experiences reported was also summarized in a score.

In general, two types of analyses for each module group were conducted. First, treatment group students' pretest results were compared with their posttest results using t-tests for paired samples. Second, t-tests for independent samples were used to compare the results obtained from post-tested treatment students to the results obtained from control students who were tested at the same time. Treatment pre- versus treatment post- comparisons were analyzed for multiple-choice and short-answer item module group scores, and competence and attitude self-rating summary scores. Treatment group/control group comparisons were conducted using multiple-choice item module group scores, competence and attitude self-rating summary scores, and professional development experience summary scores.

Data from the comparisons of the treatment group's pretest and post-test results are shown in Table IV. Multiple-choice item comparisons for all but one of the module groups show gains significant at the .05 level or better. The remaining comparison approached significance (p=.058). Since this group is composed of only two modules, the small number of items (7) probably accounted for the lack of a significant gain. Comparisons of results on short-answer items for all module groups were significant at better than the .0001 level. Comparisons of competence self-ratings for

TABLE IV

Results of Treatment Group Pretest vs. Treatment Group Posttest Paired Comparisons

		Number of Subjects	Highest Possible Score	Mean	Standard Deviation
1. Results on Multiple-Choice Items					
Module Group 1	Pretest	96	17	7.08	2.30
t = 4.28[d]	Posttest	96	17	8.29	2.44
Module Group 2	Pretest	78	20	7.74	2.67
t = 3.75[c]	Posttest	78	20	9.09	2.65
Module Group 3	Pretest	69	7	3.10	1.30
t = 1.92	Posttest	69	7	3.65	1.84
Module Group 4	Pretest	68	16	7.78	2.33
t = 2.23[a]	Posttest	68	16	8.63	3.19
2. Results on Short-Answer Items					
Module Group 2	Pretest	77	25	5.12	3.50
t = 6.90[d]	Posttest	77	25	8.64	4.68
Module Group 3	Pretest	69	10	2.97	2.15
t = 4.97[d]	Posttest	69	10	5.33	3.37
Module Group 4	Pretest	68	25	3.88	2.99
t = 6.19[d]	Posttest	68	25	8.74	5.68
3. Results on Self-Ratings of Competence					
Module Group 1	Pretest	89	72	42.13	11.72
t = 6.14[d]	Posttest	89	72	47.93	9.83
Module Group 2	Pretest	69	72	39.62	11.06
t = 8.31[d]	Posttest	69	72	49.46	8.34
Module Group 3	Pretest	65	72	43.35	10.84
t = 2.20[a]	Posttest	65	72	46.52	10.16
Module Group 4	Pretest	60	72	42.07	11.44
t = 2.90[b]	Posttest	60	72	45.60	11.56
4. Results on Self-Ratings of Attitude					
Module Group 1	Pretest	80	48	36.93	4.26
t = -0.41	Posttest	80	48	36.69	4.84
Module Group 2	Pretest	57	48	38.14	5.94
t = -0.81	Posttest	57	48	37.39	6.23
Module Group 3	Pretest	49	48	34.53	6.03
t = 2.01[a]	Posttest	49	48	36.06	4.64
Module Group 4	Pretest	54	48	33.28	6.28
t = 0.62	Posttest	54	48	33.69	7.46

[a] Significant at the .05 level
[b] Significant at the .01 level
[c] Significant at the .001 level
[d] Significant at the .0001 level

all module groups showed significant gains, but those for attitude were inconclusive.

For the treatment group/control group comparisons, it was expected that the data from pretested and posttested controls could be combined. However, preliminary analyses showed that the two control groups scored significantly differently on multiple-choice items. Therefore, data from the two control groups were not combined. Only the results from controls who were tested at the time treatment students were posttested were compared with treatment students' posttest results. Unfortunately, treatment group/control group comparisons could be calculated only for module groups 1 and 2. Based on their scores on the multiple-choice items, it appears that the control students for module groups 3 and 4 were a less able group than the treatment students, thus a treatment group/control group comparison using their scores would have overrepresented the effect of modules in groups 3 and 4.

The results of the treatment group/control group comparisons are shown in Table V. For module group 1, the comparison of multiple-choice item module group scores was significant at better than the .05 level. All other comparisons were nonsignificant.

Statistical Reliability and Generalizability of Results

Table VI presents information on treatment group students who provided data for the pretest/posttest comparisons upon which the claims of effectiveness of the VECS modules are based. These individuals represent the

TABLE V

Results of Control Group Posttest vs. Treatment Group Posttest Comparisons

		Number of Subjects	Highest Possible Score	Mean	Standard Deviation
1. Results on Multiple-Choice Items					
Module Group 1	Control	64	17	7.55	2.40
t = -2.31[a]	Treatment	109	17	8.41	2.37
Module Group 2	Control	87	20	8.72	2.56
t = -0.83	Treatment	94	20	9.04	2.57
2. Results on Self-Ratings of Competence					
Module Group 1	Control	62	72	48.15	9.00
t = 0.42	Treatment	108	72	47.50	9.94
Module Group 2	Control	84	72	48.39	8.97
t = 0.30	Treatment	93	72	47.99	8.58
3. Results on Self-Ratings of Attitude					
Module Group 1	Control	62	48	37.27	4.78
t = 1.07	Treatment	102	48	36.45	4.80
Module Group 2	Control	82	48	37.00	5.17
t = 1.97	Treatment	87	48	35.68	7.23
4. Results on Number of Recent Professional Development Experiences					
Module Group 1	Control	62	6	2.87	1.38
t = -0.56	Treatment	98	6	3.01	1.60
Module Group 2	Control	83	6	2.71	1.41
t = -0.18	Treatment	84	6	2.75	1.45

[a]Significant at the .05 level

broad range of educational attainment and experience in vocational education that would be possessed by the population of vocational educators and potential vocational educators for whom the modules are intended to provide training. Because the modules were tested on such a heterogeneous group of individuals, the results of the field test should be generalizable to the entire target population. The assertion of the statistical reliability of the field test results is based on the fact that the field test was conducted under natural conditions representing the wide variety of conditions for which the modules were designed. Each of the classes in which the modules were used can be considered a replication of the field test. Data from each of the replications were combined rather than analyzed separately due to the small number of subjects with both pretest and posttest data at each site. Nevertheless, because the modules were tested at different times and different places it is likely that the results reported are not limited to the field test.

Evidence that Effects are Attributable to the Intervention

Table VII presents information on the treatment group and control group students who provided data for the comparisons that reinforced the claims of effectiveness for module groups 1 and 2. In general, Table VII shows that the two groups were quite similar. Where differences in educational attainment and experience exist, they usually favor the control group, thus reducing the likelihood that differences in the composition of the two groups could have biased the field test results in favor of module effectiveness. The previously reported, nonsignificant comparison of the average number of professional development experiences recently experienced by the two groups supports this conclusion.

TABLE VI
Characteristics of Students in the Treatment Group

	No.	Sex		Degree				Credential		Previous Experience in Vocational Ed			Current Position				
		% M	% F	% Assoc.	% Bach.	% Mast.	% Dr.	% Teaching	% Administrative	% Teacher	% Administrator	% Curriculum Developer	% Teacher	% Administrator	% Curriculum Developer	% Undergrad. Student	% Grad. Student
Module Group 1	96	44	56	5	53	27	1	67	7	59	9	9	57	14	9	21	46
Module Group 2	78	47	53	23	47	26	1	74	5	53	5	13	55	9	15	26	44
Module Group 3	69	46	54	13	45	33	1	78	13	67	14	23	62	14	19	6	41
Module Group 4	68	41	59	6	44	44	4	75	9	46	12	18	51	15	15	1	54

TABLE VII
Characteristics of Students Providing Data to the Treatment Group/Control Group Comparisons

	No.	Sex		Degree				Credential		Previous Experience in Vocational Ed			Current Position				
		% M	% F	% Assoc.	% Bach.	% Mast.	% Dr.	% Teaching	% Administrative	% Teacher	% Administrator	% Curriculum Developer	% Teacher	% Administrator	% Curriculum Developer	% Undergrad. Student	% Grad. Student
a. Module Group 1																	
Treatment Students	109	44	56	6	51	26	1	62	6	57	8	8	56	13	9	24	44
Control Students	64	38	63	8	44	42	2	94	23	67	11	2	61	20	6	14	53
b. Module Group 2																	
Treatment Students	94	47	53	24	48	22	2	70	4	52	4	10	53	9	13	30	39
Control Students	87	40	60	6	45	43	3	93	25	70	14	2	63	20	8	10	55

NOTE FOR TABLES VI AND VII: Percentages do not always add to 100% due to rounding, missing data, or marking more than one category for Degree, Credential, Previous Experience, or Current Position.

The strongest evidence that the field test results were due to module study comes from factors in the design of the field test, however. Since the field test was conducted at different times at a number of sites, the effects of events other than module study would tend to average out. Practice effects on multiple-choice items are unlikely since different items comprised the pretest and posttest instruments. Practice effects on short-answer items and maturation effects are unlikely to have caused field test results because the tests are so closely tied to the content of the modules that gains resulting from other sources are improbable.

Educational Significance of Results

The results of the national field test demonstrated that the modules increase knowledge of topics necessary to the successful performance of skills central to the VECS role. They also tended to increase peoples' confidence in their ability to perform these skills. As vocational education expands and changes, more VECS will be needed to create and maintain high quality curricula. VECS will receive training under many different circumstances. The VECS modules provide a low cost, soundly developed resource that is adaptable to a variety of needs. The modules summarize and organize a great body of material permitting VECS training to be conducted systematically at many different types of locations.

Chapter IV

DISSEMINATION OF THE MATERIALS

In addition to attending numerous meetings and conventions of professional associations in order to introduce vocational educators to the VECS materials, AIR staff conducted a series of technical assistance forums and dissemination workshops at locations across the country. At the six one-day forums, field test instructors and site coordinators gave detailed accounts of how to use the VECS modules in various settings. Approximately 250 vocational educators from 53 states and territories attended the workshops, which were held in the following locations: Los Alamitos, California; Oklahoma City, Oklahoma; Atlanta, Georgia; Newton, Massachusetts; Columbus, Ohio; and Salt Lake City, Utah. The attendees included state-level vocational education administrators, state liaison representatives of the National Network for Curriculum Coordination in Vocational Technical Education (NNCCVTE), college and university faculty, and administrators from large school districts. The participants left the workshops with plans for using and disseminating the materials throughout their states.

In September, the vocational educators who attended the dissemination workshops were sent a number of summaries and reports that came out of the workshops for their use in following through on their state-level dissemination plans. These materials included:

- a roster of workshop participants,
- a summary of participants' reactions to the workshops,
- a listing of considerations in disseminating the modules,

- a journal article that discusses field test findings, and
- A copy of the final issue of the VECS newsletter.

A number of journal articles were written to inform vocational educators of the VECS materials including:

- Claudy, C. B., & Hamilton, J. A. Results of the national field test of the vocational education curriculum specialist materials. Journal of Vocational Education Research, Summer 1981.
- Claudy, C. B., Blank, W. E., & Hamilton, J. A. Field testing the VECS modules in Florida. Florida Vocational Journal, in press.
- Claudy, C. B., & Hamilton, J. A. Modules designed for developing VE curriculum experts. American Technical Education Association Journal, 1981, 9(2), 8.
- Claudy, C. B., Hamilton, J. A., Kelly, J. F., Cummings, J. M., & Capello, F. L. Field testing the VECS modules in New Jersey. VEANJ Journal, September 1981.
- Claudy, C. B., Hamilton, J. A., & McDonald, B. SIU's off campus field test of the VECS modules. Illinois Vocational Education Journal, in press.
- Kaplan, C. B., Hamilton, J. A., & Wheeler, J. D. The role of the vocational education curriculum specialist in fostering industry-education cooperation. Journal of Industry-Education Cooperation, 1980, 1(2), 19-25.
- Training vocational educators as curriculum developers. Voc Ed Insider, 1979, 54(5), 32d.

An agreement with the East Central Network Curriculum Center, a member of the NNCCVTE, to print and distribute the VECS materials on a cost recovery basis was approved by the Copyright Authorization Office, U.S. Department of Education. It was agreed that a complete set of the materials can

be purchased for $35.00. Included in the complete set are the 16 modules, an instructor's guide, an audio tape cassette, and a report of the field test. A complete set, or portions of it, can be ordered directly from:

East Central Network Curriculum Center
Sangamon State University, E-22
Springfield, IL 62708

APPENDIX A

List of Materials Produced Under Contract 300-78-0562

Modules

Title	Author(s)
Vocational Educators and Curriculum Management	Jeanette D. Wheeler
The Scope of Vocational Education	Jeanette D. Wheeler
Organization of Vocational Education	Jeanette D. Wheeler
Legislative Mandates for Vocational Education	Jeanette D. Wheeler
Priorities in Vocational Education	Jeanette D. Wheeler
Vocational Education for Students with Special Needs	Judith A. Appleby Jeanette D. Wheeler
Vocational Needs Assessment and Curriculum Development	Judith A. Appleby
~~Conducting Task Analyses and Developing~~ Instructional Objectives	Judith A. Appleby
Selecting Instructional Strategies and Assessing Student Achievement	Judith A. Appleby
Relating Learning Differences and Instructional Methods	Carol B. Kaplan
Selecting and Preparing Instructional Materials	Judith A. Appleby
Evaluating Vocational Education Curricula	Jean Wolman Carolyn B. Claudy
Conducting Follow-up Studies and Communicating Evaluation Results	Carolyn McFarlane Carolyn B. Claudy
Managing Vocational Education Programs	Judith A. Appleby
Preparing for Curriculum Change	Judith A. Appleby
Staff Development	Barbara Pletcher

Guide

Title	Author(s)
Using the VECS Modules: A Guide for Instructors and Administrators	Carolyn B. Claudy Jeanette D. Wheeler

Audio Casette Tape

Title	Author(s)
Using the VECS Modules: Comments of Vocational Educators	Jurgen M. Wolff

Convention Papers

Title	Convention/Date	Author(s)
The National Field Test of the Vocational Education Curriculum Specialist Materials	American Vocational Association. 12/79	Jack A. Hamilton Carolyn B. Claudy
Results of the National Field Test of the Vocational Education Curriculum Specialist Materials	American Vocational Assocation. 12/80	Carolyn B. Claudy Jack A. Hamilton
Making Vocational Curriculum Responsive to Student Needs	American Personnel & Guidance Association. 4/80	Jack A. Hamilton Carolyn B. Claudy

Journal Articles

Title	Journal/Date	Author(s)
Training Vocational Educators as Curriculum Developers	VocEd Insider	Jack A. Hamilton Carol B. Kaplan
The Role of the Vocational Education Curriculum Specialist in fostering industry-education cooperation	Journal of Industry-Education Cooperation	Carol B. Kaplan Jack A. Hamilton Jeanette D. Wheeler
SIU's Off-Campus Field Test of the VECS Modules	Illinois Vocational Education Journal	Carolyn B. Claudy Jack A. Hamilton Bruce McDonald
Field Testing the VECS Modules in New Jersey	VEANJ Journal	Carolyn B. Claudy Jack A. Hamilton
Modules Designed for Developing VE Curriculum Experts	ATEA Journal	Carolyn B. Claudy Jack A. Hamilton
Field Testing the VECS Modules in Florida	Florida Vocational Journal	Carolyn B. Claudy William E. Blank Jack A. Hamilton
Results of the National Field Test of the Vocational Education Curriculum Specialist Materials	Journal of Vocational Education Research	Carolyn B. Claudy Jack A. Hamilton

Joint Dissemination Review Panel Submission

Title	Date	Author(s)
Submission to the JDRP	11/80	Carolyn B. Claudy Jack A. Hamilton Steven M. Jung

VECS Newsletters

Title	Date	Editor(s)
VECS newsletters, three issues	1978-1979	Carol B. Kaplan
VECS newsletters, three issues	1979-1980	Barbara Pletcher Emily Campbell
VECS newsletters, three issues	1980-1981	Emily Campbell Carolyn B. Claudy

Technical Reports

Title	Date	Author(s)
Plan for Familiarization Program (1)	11/78	Carol B. Kaplan Jack A. Hamilton
Guidelines for Revision: Recommendations for Integrating and Updating WSU and AIR VECS Materials (2)	3/79	Judith A. Appleby Jack A. Hamilton Carol B. Kaplan Jeanette D. Wheeler
Study Design and Analysis Plan (3)	4/79	Steven M. Jung Carolyn B. Helliwell Jack A. Hamilton
Plan for Familiarization Program-Phase II (4)	11/79	Carol B. Kaplan Jack A. Hamilton
Plan for Familiarization Program-Phase III (5)	2/81	Jack A. Hamilton
Written Summary of Consultations with Staff at Module-Using Sites (6)	5/81	Jack A. Hamilton
Written Summary of Workshop Accomplishments (7)	9/81	Jack A. Hamilton

Final Technical Report

Title	Date	Author(s)
Field Testing Vocational Education Curriculum Specialist Materials	9/81	Jack A. Hamilton Carolyn B. Claudy

Summary Abstract

Title	Date	Author(s)
Field Testing Vocational Education Curriculum Specialist Materials	9/81	Jack A. Hamilton Carolyn B. Claudy

Executive Abstract

Title	Date	Author(s)
Field Testing Vocational Education Curriculum Specialist Materials	9/81	Jack A. Hamilton Carolyn B. Claudy