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ABSTRACT

Two research questions are addressed in this report: What outcomes are appropriate and feasible to use as criteria for evaluating vocational programs? and What procedures can be used for evaluating vocational education on the basis of specified outcome criteria? Following brief reference to earlier studies on vocational education outcomes, fifteen possible outcomes are listed and discussed in terms of their importance, appropriateness, and feasibility for use in evaluation: improving basic educational skills, development of useful occupational skills, reducing the risk of unemployment, acquiring world-of-work knowledge, effect on educational commitment, development of leadership qualities, postsecondary educational progress, level of postschool earning, satisfaction with current school experience, job-search time, satisfactoriness to employers, attractiveness of the community for industrial development, employment opportunities for minority workers, job placement in training-related fields, and development of self-help skills. Fourteen essential elements of information for an evaluation study are then identified and notes are provided for operationalizing each of the fifteen outcomes. Finally, a brief report is given of a pilot study testing one outcome (reducing the risk of unemployment for minority youth) carried out with vocational education personnel in two states. Findings are summarized and recommendations made for further research, development, and evaluation activities. (JT)

Research and Development Series No. 192

SOME KEY OUTCOMES OF VOCATIONAL EDUCATION: A REPORT ON EVALUATION CRITERIA, STANDARDS, AND PROCEDURES

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The National Center for Research in Vocational Education
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1980

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CONTENTS

LIST OF TABLES

FOREWORD

Program evaluation is a basic component of good management as well as a legislative requirement. Evaluation research can generate data to serve as a basis for informed decisions on matters of policy, program design, and program operation. But what criteria should be used for evaluating vocational education? And what procedures offer promise for maximum returns from investments in evaluative research?

These two questions are specifically addressed in this report, which carries the National Center's ongoing study of vocational education outcomes beyond the exploratory stage. (See Chapter I for titles of four earlier publications resulting from the outcomes study.) Presented here is a detailed discussion of (a) fifteen key outcomes of vocational education, (b) issues related to the "validation" of these outcomes, (c) operational procedures for conducting outcomes studies, and (d) some results from pilot testing these procedures with one of the hypothesized outcomes. The report concludes with a summary of lessons learned and recommendations offered for applying the findings and products of the study.

Readers who may find this report of particular interest include vocational education evaluators, state and local vocational directors, sponsors of evaluation studies, policy analysts, members of the academic community, and people who advise and make decisions on vocational education policy.

The National Center is pleased to acknowledge the advice and assistance of several individuals who made important contributions to this study. Serving as project consultants were Dr. Paul A. Games, Pennsylvania State University; Dr. John T. Grasso, West Virginia University; Dr. Douglas Sjogren, Colorado State University; Dr. Jesse S. Clemmons, North Carolina Department of Education; and Jeanette F. McConaughy, Worthington, Ohio. Helpful suggestions were provided by Dr. Betsy Bozak Houser, Education Director of Fink and Kosecoff, Inc., of Santa Monica, California, and Dr. Frederick Haddad, Connecticut Department of Education, both of whom reviewed a draft of the report. Dr. Ruth Hughes, Iowa State University, and Dr. George Copa, University of Minnesota, both members of the National Center's Evaluation Technical Advisory Panel, provided special assistance in the study. Kathleen A. Bolland contributed ideas and assisted in field work during the early stages of the study. The study was sponsored by the Bureau of Occupational and Adult Education, U.S. Office of Education.

The National Center is grateful to Dr. Robert L. Darcy, Senior Research Specialist, for directing the outcomes study and preparing this report; and to Pamela J. Davis for her excellence in typing the manuscript.

Robert E. Taylor
Executive Director
The National Center for Research
in Vocational Education

I. BACKGROUND AND PERSPECTIVE

Vocational education, along with other human service programs, can be evaluated on the basis of many different criteria and, indeed, diverse types of criteria. In an earlier report on the National Center's examination of vocational education outcomes (Darcy, 1979a) six different types of evaluation criteria were identified. These include (1) the context in which vocational education operates, (2) characteristics of the students enrolled in vocational programs, (3) the quantity and quality of resources used in vocational education, (4) program goals and objectives, (5) processes utilized for instruction and related activities, and (6) the consequences or outcomes of the overall vocational education enterprise.

The evaluation arena is broad and complex, and in vocational education there is much to be seen and studied. Not everything can be done all at once. The particular terrain on which the present study focuses is *outcomes*. The inquiry proceeds on the assumption that outcomes are important and may even be the most important basis for evaluating vocational education; but outcomes are definitely not the only basis for evaluating vocational programs.

A. Research Questions Addressed

Two research questions are specifically addressed in this report:

- What outcomes are appropriate and feasible to use as criteria for evaluating vocational programs?
- What procedures can be used for evaluating vocational education on the basis of specified outcome criteria?

B. Relationship to Other Studies

This report contains ideas and information based on what might be termed Phase Two of a projected long-term examination of vocational education outcomes and their correlates (Darcy, Bolland, and Farley, January 1979).

Phase One was exploratory, focusing on conceptual issues, reviewing the literature of outcomes evaluation, and seeking to expand awareness of the range and diversity of vocational education outcomes. This phase resulted in publication of the following documents:

- Bolland, Kathleen A. *Vocational Education Outcomes: An Evaluative Bibliography of Empirical Studies*. Bibliography Series No. 49. Columbus: National Center for Research in Vocational Education, The Ohio State University, 1979.
- Darcy, Robert L. *Vocational Education Outcomes: Perspective for Evaluation*. Research and Development Series No. 163. Columbus: National Center for Research in Vocational Education, The Ohio State University, 1979.

- Farley, Joanne. *Vocational Education Outcomes: A Thesaurus of Outcome Questions.* Research and Development Series No. 170. Columbus: National Center for Research in Vocational Education, The Ohio State University, 1979.

- Taylor, Carolyn M.; Darcy, Robert L.; and Bolland, Kathleen A. *Vocational Education Outcomes: Annotated Bibliography of Related Literature.* Bibliography Series No. 48. Columbus: National Center for Research in Vocational Education, The Ohio State University, 1979.

A related National Center project addressed the problem of interpreting outcome measures in vocational education (McKinney, Gray, and Abram; September 1978) and also resulted in the publication of a collection of papers expressing alternative viewpoints on outcome measures and their interpretation (McKinney and Harvey, September 1978). Two evaluation handbooks were produced dealing with vocational education outcomes (Franchak and Spirer; 1978 and 1979); and five state-of-the-art papers touching on various aspects of outcomes evaluation were published by the National Center (including Grasso, 1979). A report on the status of vocational education in the United States as of 1975-76 was issued (National Center, 1978) and plans were made for publishing a similar report in 1980 covering the 1976-77 school year and including some outcome data collected in early 1978.

Phase Two of the ongoing study of vocational education outcomes carried the investigation to a more operational level, including some preliminary empirical work. In effect, this phase has prepared a research, development, and evaluation (RD&E) agenda for conducting definitive empirical studies on a wide range of employment-related outcomes, as well as other types of outcomes, and for examining the correlates of particular outcomes, i.e., programmatic and nonprogrammatic factors significantly associated with observed outcomes.

Related projects at the National Center during 1979 involved a preliminary investigation of the correlates of successful job placement of former vocational students, the preparation of handbooks on performance testing, and development of specifications for conducting longitudinal studies of former vocational students.

Outside the National Center, a major study and evaluation of vocational education (including the *effects* of vocational programs) was under way at the National Institute of Education (David, 1979). Evaluation studies on vocational education outcomes were reported by the Carnegie Council (Grasso and Shea, 1979), the National Bureau of Economic Research (Meyer and Wise, May 1979), and other sources.

C. Organization of This Report

In Chapter II, fifteen possible outcomes of vocational education are identified and discussed in terms of their importance, appropriateness, and feasibility for use as evaluation criteria. Chapter III identifies fourteen "Essential Elements of Information for An Evaluation Study" and provides notes for operationalizing fifteen outcomes. Chapter IV gives a brief report on the pilot testing of one outcome, "Reducing the Risk of Unemployment for Minority Youth," carried out in collaboration with vocational education personnel in two different states. Chapter V summarizes findings and offers recommendations for further research, development and evaluation activities.

II. OUTCOMES AS EVALUATION CRITERIA

Some basic concepts related to outcomes evaluation, discussed in more detail elsewhere (Darcy, 1979 a,b), are briefly recapitulated in this chapter. Then fifteen possible outcomes of vocational education are listed and discussed in terms of their importance, appropriateness, and feasibility for use in evaluation.

A. Concepts and Terminology

In this study, vocational education outcomes are broadly defined as the consequences of vocational programs. Outcomes include "products," "outputs," "effects," "results," and "impacts." No technical distinctions are suggested here for differentiating these various terms. Program consequences can usefully be described in terms of (1) a time framework (e.g., immediate, short-term, and long-term outcomes), (2) the amount of influence or control a program operator (e.g., a local education agency or local high school) exercises with respect to particular consequences, and (3) other considerations. It is also useful to distinguish among *possible* outcomes, *desired* outcomes, and *actual* outcomes. Vocational education outcomes are manifested as changes in individual or societal capabilities, attitudes, status, or circumstances. The present report focuses on outcomes in their role as evaluation criteria, i.e., the tests or bases in terms of which vocational programs are to be judged.

Outcomes can be verbalized in the form of statements or questions. An example of an outcome statement is the declarative sentence: "Completers of high school vocational programs earn higher hourly wages three years after leaving school than comparable completers of college preparatory or general curricula." An outcome statement describes what happens to whom, as well as how, where, when, and why it happens.

We can identify six elements of a complete outcome statement: (1) the change in capability or circumstance that constitutes the outcome; (2) an entity (person or thing affected by the program) in which the outcome is manifested; (3) the program or "treatment" that induces the outcome; (4) the agency or channel through which the program is delivered; (5) a time framework; and (6) a rationale or theoretical explanation of why the outcome results from the program.

In the example cited above, the outcome (i.e., hypothesized dependent variable) is higher hourly earnings. Program completers are the affected entity. High school vocational programs are the "treatment" (i.e., strategic independent variable). The high school offering the program is the agency. Three years after leaving school is the time frame. Unstated above was a rationale linking higher earnings to participation in a vocational program (e.g., instruction in occupational skills helps increase productivity and qualifies workers for better paying jobs). Not every outcome statement will address all six elements of information; but as a minimum, a meaningful outcome statement will clearly identify the outcome, affected entity, and program "treatment."

Outcomes, as suggested earlier, can also be described in the form of questions. Example: "Do completers of high school vocational programs earn higher hourly wages three years after

leaving school than comparable completers of academic or general curricula?" Or the question may be phrased in more neutral terms: "How do the hourly earnings of high school vocational completers compare with the earnings of similar completers of academic or general curricula three years after leaving school?" (The question "What are the mean hourly earnings of high school vocational completers four years after leaving school?" would be a possible research question or "follow-up" question but would not, in the view of the project staff, constitute an evaluation inquiry since it provides no basis for an evaluative judgment.)

Because of two important advantages, the project staff elected to use the question format (Farley, 1979). First, it is easier to formulate outcome questions in more neutral terms than is the case with the outcome statements. Even more important, one is less likely to be misunderstood when a question mark rather than a period appears at the end of a sentence. Declarative sentences can give the impression that the writer is asserting a claim or belief, or indeed reporting documented facts regarding actual outcomes. At this stage of evaluative research in vocational education, however, there appears to be little documented knowledge that can be generalized with respect to actual outcomes. Questions concerning possible outcomes, on the other hand, abound.

B. Some Key Outcomes of Vocational Education

Table 1 lists fifteen possible outcomes of vocational education and corresponding questions intended to clarify the outcome titles. The list includes "job placement in training-related fields" (Outcome No. 14) and "satisfactoriness to employers" (Outcome No. 11), two outcomes prescribed in the Education Amendments of 1976 as criteria for evaluating the effectiveness of vocational programs. Also included are consequences frequently cited as intended outcomes (i.e., goals or objectives) of vocational education. Some others on the list are less familiar and may even suggest the possibility of unintended and detrimental effects.

Several of the questions in Table 1 specify a limited program population (e.g., Outcome No. 3), a particular level of schooling (e.g., Outcome No. 4) or a certain time framework (e.g., Outcome No. 8). It should be understood that outcome questions can be written in a variety of ways, almost without limit. The specificity expressed in some questions appearing in this table is intended to demonstrate various possible evaluation studies, some of which will have greater relevance to a particular state or local school than broad-based studies or evaluations that focus on different subpopulations. There is nothing sacrosanct about any particular focus indicated by the questions as formulated in Table 1.

This list of outcomes does not claim to be authoritative, much less authoritarian. It is best perceived as a sample of the numerous and diverse possible outcomes for which vocational education might be held accountable. These are "key outcomes" in the sense that they have been identified by the project staff as being significant in themselves and as having special importance in evaluation, e.g., to illustrate diversity, conceptual complexity, methodological alternatives, and statistical problems. Which of these outcomes, if any, should be used for evaluation purposes in a given situation would presumably be determined by policy makers, evaluation sponsors, or program operators in particular state and local settings.

This list of fifteen outcome questions can be compared with a list of thirty (Darcy, 1979a) and the extensive, categorized list of 252 (Farley, 1979) that appeared in earlier project reports. A list of ten outcome statements was used as the basis for discussions by a national panel (Darcy, Bolland, and Farley, 1979). And a list of twenty outcome questions was included in a paper

Table I

SOME KEY OUTCOMES OF VOCATIONAL EDUCATION

Outcome	Outcome Question
(1) Improving basic educational skills	To what extent do students who are enrolled in vocational education improve their basic educational skills (communications and numerical calculation)?
(2) Development of useful occupational skills	Do students acquire useful occupational skills by participating in vocational programs?
(3) Reducing the risk of unemployment	What effect does completion of a high school vocational program have on the risk of unemployment for minority youth?
(4) Acquiring world-of-work knowledge	Do postsecondary vocational students acquire greater world-of-work knowledge from their programs than comparable nonvocational students derive from theirs? (Defined to include occupational information and knowledge of labor market and work adjustment processes.)
(5) Effect on educational commitment	Does enrollment in a high school vocational program strengthen the educational commitment of economically disadvantaged students? (As measured by school attendance records and dropout rates.)
(6) Development of leadership qualities	Does enrollment in a high school vocational program promote the development of leadership qualities?
(7) Postsecondary educational progress	What effect does enrollment in a high school vocational program have on access to and early success in various forms of postsecondary education?

Table 1 (continued)

SOME KEY OUTCOMES OF VOCATIONAL EDUCATION

Outcome	Outcome Question
(8) Level of postschool earnings	What effect does vocational education have on the earnings of young workers during their first two years after leaving school?
(9) Satisfaction with current school experience	Do students enrolled in vocational programs express more, less, or the same satisfaction with their current school experience as comparable nonvocational students?
(10) Job-search time	What effect does vocational education have on the length of time it takes young workers to find full-time employment after leaving high school?
(11) Satisfactoriness to employers	How do employers rate former vocational students as compared with comparable nonvocational students in terms of attitudes, abilities, and performance on the job?
(12) Attractiveness of the community for industrial development	What effect does vocational education have on the community as a site for industrial location or expansion?
(13) Employment opportunities for minority workers	What effect does the existence of an extensive vocational education program have on the occupational distribution of minority workers?
(14) Job placement in training-related fields	To what extent do former vocational students find employment in occupations related to their training?
(15) Development of self-help skills	To what extent do high school vocational students acquire economically valuable consumer and other self-help skills?

SOURCE. Project staff, National Center for Research in Vocational Education, The Ohio State University, 1979.

presented at the 1979 annual conference of the American Vocational Education Research Association (Darcy, 1979b). The latter consisted of the fifteen questions appearing in Table 1 plus the following:

Outcome	Outcome Question
• Effect on student self-image	Does vocational education have a more favorable or less favorable effect on student self-confidence and self-image than general/academic curricula?
• Economic returns	Are the economic returns on investments in vocational education lower, higher, or the same as returns on investments made in academic/general programs below the baccalaureate level?
• Effect on early job experience	What effect does enrollment in a vocational curriculum have on the quantity and quality of job experience that young people acquire before they leave high school?
• Socioeconomic understanding	Do students who complete vocational programs develop a better understanding of the practical realities of our economic system than students who complete the same number of years of schooling in a general/academic program?
• Job satisfaction	Do completers of vocational programs at the postsecondary level express higher, lower, or the same level of job satisfaction when compared with similar young people having the same quantity of schooling, after five years of post-school employment?

Some evaluation experts with whom the project staff consulted have suggested additional outcomes for inclusion in a basic list, notably "employability development." This one, among others, was omitted because it was considered too resistant to operational formulation.

C. Considerations Influencing the Choice of Outcome Criteria

To be suitable for use as an evaluation criterion, an outcome must be important and appropriate: i.e., not trivial and not simply of marginal relevance to the mission of vocational education. The outcome must also be feasible to operationalize in the sense that, unlike the question of how many angels can dance on the head of a pin, it can actually be studied empirically. Feasibility can be defined to include issues of cost, timing, administrative burden, information access, propriety, acceptability, and the likelihood that people will be cooperative in conducting the study. Finally, an outcome selected for study should hold promise of generating information that can be used in making decisions that will actually influence programs or policies.

The relative importance of the respective considerations will vary with circumstances, but it seems clear that hypothesized outcomes should meet minimum standards with respect to each of these sets of considerations. Moreover, one must resist the temptation to study what is easy to study rather than what ought to be studied (Weiss, 1972). At the same time evaluators should be encouraged to express concerns they may have about the practical difficulties they anticipate in studies they are asked to conduct.

In the judgment of the project staff, many outcome criteria fail to qualify as suitable on the basis of the above considerations. Informal discussions with members of the vocational education community and with experienced program evaluators (see Section D below) indicate widespread agreement with this perception. Even familiar evaluation criteria, such as placement in training-related jobs and "satisfactoriness" to employers may have doubtful merit in terms of importance/appropriateness, feasibility, and usefulness for decisionmaking. Yet such criteria are mandated as the basis for evaluating program effectiveness (Education Amendments of 1976, Sec 112b).

Choosing evaluation criteria is a topic that has evidently received little professional attention. Thus, there not only appears to be a lack of agreement on which particular outcomes should be used for evaluating vocational education (Reubens 1974, and Section D below) but also no consensus on procedures that could help in the selection of an accepted set of outcomes. Extensive discussion of this point will not be presented here, but it is suggested that choosing evaluation criteria is a critical step in any evaluation study. More attention should be paid to the rationale for such choices, i.e., to the cogency of the arguments in support of these instrumental value judgments.

D. The "Validation" of Outcome Criteria

Valid criteria for appraising vocational education on the basis of outcomes may be thought of as criteria that do what they purport to do. Should vocational education be held accountable for the success or failure of former vocational students in the job market? for the sort of citizens they become? for whether they graduate from high school? Value judgments are called for in establishing evaluation criteria (as well as setting evaluation standards). The task is similar to, though not precisely the same as, defining the mission and purpose of vocational education.

There is no simple way to "validate" outcome criteria apart from a simplistic appeal to authority (whether by legislative mandate or opinion surveys). This is not to suggest that one criterion is as good as another but rather to recognize that thoughtful inquiry, empirical data, and well-informed dialogue are required to generate the right questions to be addressed by evaluative research. These questions are likely to be numerous, to vary among states and local communities, and to change with the passage of time.

After considerable conceptual exploration and a limited amount of mostly unsatisfactory empirical investigation, the staff decided to poll a small, nonrandom sample of individuals knowledgeable in vocational education and experienced in program evaluation. Nine experts, responding individually and informally (not by means of a Delphi or Nominal Group Technique), were asked to rate the fifteen outcomes listed in Table I on the basis of (a) appropriateness/importance, (b) feasibility, and (c) overall rating, all things considered. Table 2 shows the results. Attachment A reproduces the instructions given to the raters, while Attachment B identifies the nine individuals who submitted the ratings.

Checkmarks in the extreme right column identify the outcomes that received high overall ratings from five or more of the nine panelists. The one unanimous choice was "Developing Useful Occupational Skills" (No. 2). But even here, three of the raters expressed reservations about the feasibility of evaluating vocational education on the basis of this criterion.

Two other outcomes received five high ratings: "Improving Basic Educational Skills (No. 1) and "Effect on Educational Commitment" (No. 5).

The remaining twelve outcomes—including the two mandated in the Education Amendments of 1976 (No. 11 and No. 14)—failed to generate much enthusiasm from the group.

No claim is made that these ratings are representative of any particular large group. Based on the exploratory work alluded to above, as well as on statements reported in the professional and popular media, we suspect that diverse constituencies would express conflicting views. One may infer that no broad consensus exists concerning the particular outcomes that should be used as criteria for evaluating vocational education. Specific states, local communities, and individual schools may attach great importance to different outcomes at different times, in different situations, and argue convincingly that these are the outcomes for which they choose to be accountable.

One implication of nonconsensus—as illustrated in Table 2—may be that far more thought, data, and dialogue are needed as a basis for determining the mission of vocational education and the particular outcomes for which it should realistically be held accountable. An outcome "validation" exercise involving education officials, advisory councils, policy analysts, and experienced evaluators could stimulate revealing and fruitful discussions at community, state, and national levels.

TABLE 2
RATINGS OF FIFTEEN POSSIBLE OUTCOMES OF VOCATIONAL EDUCATION FOR USE AS EVALUATION CRITERIA (N=9)

Outcome & Outcome Question	Appropriateness & Importance	Feasibility	Overall Rating	High Overall Rating
1. IMPROVING BASIC EDUCATIONAL SKILLS. How effectively do students who are enrolled in vocational education learn the basic education skills of communication and numerical calculation?	High –5 Interm. –2 Low –2	High –5 Interm. –4 Low –0	High –5 Interm. –2 Low –2	✓
2. DEVELOPING USEFUL OCCUPATIONAL SKILLS. Do students acquire useful occupational skills by vocational programs?	High –9 Interm. –0 Low –0	High –6 Interm. –3 Low –0	High –9 Interm. –0 Low –0	✓
3. REDUCING THE RISK OF UNEMPLOYMENT. What effect does completion of a high school vocational program have on the risk of unemployment for teenage minority workers?	High –4 Interm. –2 Low –3	High –2 Interm. –4 Low –3	High –1 Interm. –5 Low –3	
4. ACQUIRING WORLD-OF-WORK KNOWLEDGE. Do postsecondary vocational students acquire greater world-of-work knowledge than comparable nonvocational students? (Defined to include occupational information and knowledge of labor market processes.)	High –5 Interm. –4 Low –0	High –4 Interm. –5 Low –0	High –2 Interm. –7 Low –0	
5. EFFECT ON EDUCATIONAL COMMITMENT. Does enrollment in a high school vocational program strengthen the educational commitment of economically disadvantaged students? (As measured by school attendance records and dropout rates.)	High –5 Interm. –3 Low –1	High –7 Interm. –0 Low –2	High –5 Interm. –2 Low –2	✓
6. DEVELOPMENT OF LEADERSHIP QUALITIES. Does enrollment in a high school vocational program promote the development of leadership qualities?	High –1 Interm. –6 Low –2	High –0 Interm. –3 Low –6	High –0 Interm. –5 Low –4	
7. POSTSECONDARY EDUCATIONAL PROGRESS. What effect does enrollment in a high school vocational program have on access to and early success in various forms of postsecondary education?	High –1 Interm. –7 Low –1	High –4 Interm. –4 Low –1	High –1 Interm. –6 Low –2	
8. LEVEL OF POSTSCHOOL EARNINGS What effect does vocational education have on earnings of young workers during their first two years after leaving school?	High –5 Interm. –3 Low –1	High –3 Interm. –5 Low –1	High –4 Interm. –4 Low –1	

TABLE 2 (continued)

Outcome & Outcome Question	Appropriateness & Importance	Feasibility	Overall Rating	High Overall Rating
9. SATISFACTION WITH CURRENT SCHOOL EXPERIENCE. Do students who are enrolled in vocational programs express more, less, or the same satisfaction with their current school experience as comparable nonvocational students?	High –4 Interm. –4 Low –1	High –4 Interm. –4 Low –1	High –1 Interm. –8 Low –0	
10. JOB-SEARCH TIME. What effect does vocational education have on the length of time it takes young workers to find full-time employment after leaving high school?	High –4 Interm. –4 Low –1	High –3 Interm. –5 Low –1	High –2 Interm. –7 Low –0	
11. SATISFACTORINESS TO EMPLOYERS. How do employers rate former vocational students as compared with comparable nonvocational students in terms of attitudes, abilities, and performance on the job?	High –7 Interm –1 Low –1	High –1 Interm. –5 Low –3	High –4 Interm. –4 Low –1	
12. ATTRACTIVENESS OF THE COMMUNITY FOR INDUSTRIAL DEVELOPMENT. What effect does vocational education have on the attractiveness of the community as a site for industrial location or expansion?	High –2 Interm. –6 Low –1	High –0 Interm. –1 Low –8	High –1 Interm. –4 Low –4	
13 EMPLOYMENT OPPORTUNITIES FOR MINORITY WORKERS. What effect does the existence of an extensive vocational education program have on the occupational distribution of minority workers?	High –4 Interm. –3 Low –2	High –1 Interm. –1 Low –7	High –1 Interm. –6 Low –2	
14. JOB PLACEMENT IN TRAINING-RELATED FIELDS. To what extent do former vocational students find employment in occupations related to their training?	High –6 Interm. –4 Low –0	High –3 Interm. –6 Low –0	High –4 Interm. –5 Low –0	
15. DEVELOPMENT OF SELF-HELP SKILLS. To what extent to high school vocational students acquire economically valuable consumer and other self-help skills?	High –4 Interm. –4 Low –1	High –1 Interm. –3 Low –5	High –2 Interm. –5 Low –2	

SOURCE. See text and Attachment A and B; National Center for Research in Vocational Education, The Ohio State University, 1979.

Table 2 (continued)
ATTACHMENT A

Instructions for Rating Outcome Criteria

Listed on the following pages are fifteen possible outcomes or consequences of vocational education along with questions intended to define the respective outcomes in more specific terms. (These outcomes were selected by the project staff from a file of over 200 possible outcomes as being significant, though not necessarily the most important of all outcomes that might be selected for use as evaluation criteria. They are not intended to represent the goals or objectives of vocational education.)

Please use the terms *High*, *Intermediate*, or *Low* (write "High," "Intermediate," or "Low" in the respective columns) to rate the outcomes exactly as they are described, without changing the wording or indicating any particular interpretations or reservations you might have. (We recognize that many of the outcome questions could be rephrased to apply to different populations such as secondary rather than postsecondary, or all students rather than just minority students.)

"Appropriateness and Importance" refers to the suitability of using the particular outcome as one of several criteria for evaluating vocational education, *on the assumption that it can be operationalized*. A rating of High in the column headed "Appropriateness and Importance" means you feel that particular outcome is highly appropriate and important. A rating of Low means that it is not appropriate for vocational education to be evaluated on the basis of the outcome, even though the outcome may be important for some other program.

Feasibility refers to the practicality of using the particular outcome as an evaluation criterion. Given the various conceptual, statistical, administrative, legal, and other problems, how feasible is it to use the outcome? "Feasible" means the evaluation is capable of being accomplished—not whether it *should* "theoretically" be done, but whether it *can* be done.

An *Intermediate* rating in the "Feasibility" column for a given outcome indicates that it would be quite possible to collect valid data and carry out the evaluation, though not without difficulty or substantial cost in terms of administrative burden, lapse of time, expense, etc.

An "Overall Rating" of *Low* indicates that on balance—considering both appropriateness/importance and feasibility—you would not recommend that this outcome be used as one of half dozen or so outcome criteria on which the success or failure of vocational education might be judged. A *High* rating means all things considered you would recommend its use. The overall rating will approximate a weighted average of appropriateness/importance *plus* feasibility, with you providing the implicit weights.

Table 2 (continued)

ATTACHMENT B

Individuals Who Rated the Fifteen Outcomes

DR. HERMINE CHERN. Associate in Charge, Career Education Evaluation Unit, School District of Philadelphia, Philadelphia, Pennsylvania.
Conducts evaluation studies of vocational education and career education programs involving inner-city youth and adults; member of American Educational Research Association, Pennsylvania Educational Research Association, American Personnel Guidance Association; author of *Evaluation of Federally Funded Vocational Education Projects*, 1979.

DR. JESSE S. CLEMMONS. Director, Program Improvement Unit, Division of Vocational Education, State Department of Public Instruction, Raleigh, North Carolina.
Former high school vocational teacher; more than ten years of research and evaluation experience in vocational education; responsible for management information system, research coordinating unit, and statewide evaluation programs in North Carolina; doctoral studies at Pennsylvania State University emphasized evaluation and research; active in National Conference of RCUs.

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III. EVALUATION PROCEDURES

This chapter identifies fourteen elements of information considered by the project staff to be essential for evaluating vocational education on the basis of outcomes. Following a brief discussion of three of the most crucial elements—empirical indicators, evaluation design, and evaluation standards—notes are provided for use in operationalizing each of the fifteen key outcomes identified in Chapter II above.

A. Essential Elements of Information

Table 3 lists fourteen items of information considered by the project staff to be essential for planning, carrying out, and reporting evaluation studies focusing on vocational education outcomes. The procedures are based on a conceptual model according to which a *program* (e.g., vocational education) is judged "good" or "bad" in terms of a specified *criterion* (e.g., an hypothesized outcome selected as the test or basis for judging merit) to the extent that a given *empirical indicator* (e.g., a test score, unemployment rate, etc.) attains a specified *evaluation standard* (i.e., relative or absolute level of performance). Thus, in program evaluation there must always be a criterion (test), an empirical indicator (measure), and an evaluation standard (specified performance level).

Any resulting evaluative judgment would be limited and tentative, based on the particular outcome criterion and data observations. No comprehensive, definitive judgment concerning the overall merit of a program should be formulated until a broad range of appropriate criteria are examined and sufficient empirical observations made both for the program population and the comparison group. The chief virtues claimed for the procedures listed in Table 3 are explicitness, comprehensiveness, and provision for reporting and applying evaluation findings.

The meaning and importance of each element in the checklist is perhaps better conveyed through specific illustrations than with general definitions. Table 4 applies the checklist to all fifteen of the key outcomes identified in Chapter II. Only brief explanations are provided here for the respective elements.

Checklist Item No. 1 requires a clear statement of the outcome question to be answered. This defines the problem to be studied, which is the first step in systematic decision-making (Darcy and Powell, 1973). Item 2 identifies the particular change that is hypothesized to result from exposure to the independent variable (though not yet the specific way of measuring that change). Item 3 describes the student population or other entity (such as a school, local labor market, or the community as a whole) in which the outcome is hypothesized to have occurred. Item 4 describes the program or "treatment" that is identified as the (most important) independent variable in the study. Item 5 provides a theoretical explanation of why there may

Table 3

ESSENTIAL ELEMENTS OF INFORMATION IN AN OUTCOMES EVALUATION

	CHECKLIST OF ELEMENTS
(1)	Outcome question to be answered.
(2)	Outcome hypothesized as the dependent variable.
(3)	Affected entity (student population or other entity in which the outcome is observed).
(4)	Program identified as the strategic independent variable.
(5)	Rationale for the hypothesized outcome and appropriateness of the outcome as a basis for evaluating the program.
(6)	Empirical indicators of the outcome.
(7)	Methodological considerations (evaluation design, sampling procedures, statistical analysis).
(8)	Evaluation standard (basis for interpreting outcome data to judge program effectiveness).
(9)	Data requirements (instruments, procedures, data base).
(10)	Feasibility of investigating this outcome (conceptual, administrative, cost, time, other considerations).
(11)	Findings (results of data analysis, warranted inferences, generalizability).
(12)	Potential impact of findings (implications for policy, program design, and management, image of vocational education).
(13)	Dissemination of findings and suggested applications.)
(14)	Implications of findings for further research, development, and evaluation (RD&E) activities and relationship of this evaluation to previous studies.

SOURCE: Project staff, National Center for Research in Vocational Education, The Ohio State University, 1979.

indeed be a significant association or linkage between the independent and dependent variables. This item also calls for a rationale to justify using the specified outcomes as a basis (perhaps one among several) for appraising the efficacy of the independent variable.

Item 6 identifies one or more specific ways of measuring the outcome in question. Item 7 indicates how the evaluation study is to be approached methodologically. Item 8 posits the level of attainment to which the performance of the affected entity will be compared. And Item 9 specifies the kinds of information required to generate the necessary empirical indicators, along with data-collection instruments and procedures that may be appropriate. Because Items 6, 7, 8, and 9 are so crucial for a bona fide, data-based evaluation, additional attention is given to them in Sections B and C below.

Checklist Item 10 is intended to alert the designers of the evaluation study to potential hazards, costs, and limitations. Items 11, 12, 13, and 14 are both futuristic and retrospective, inviting evaluators first to consider how they might deal with different possible results, (anticipation of which might induce timely modifications in how the study is finally designed), and then what to do with the actual results once they become known. A major question addressed by Item 11 concerns validity, both internal and external (Anderson et al., 1975). Facts seldom speak for themselves. What inferences are warranted from the facts observed in the evaluation study in question? And to what extent can the inferences be generalized to other populations? Item 12 relates to the utility of the study, reminding one that the purpose of evaluation, in contrast to research, is not to produce knowledge for its own sake but rather to generate information that will be useful in making decisions about the program that was the object of the evaluation study (Oetting, 1976 Part I). Item 13 is the process that can transform the potential identified in Item 12 into practical applications and actual benefits of the evaluation study. Finally, Item 14 calls for the evaluator to relate the procedures and findings of the study to those of past investigations and to suggest future lines of inquiry that might be especially fruitful in explaining what works, how, and why in this particular area of vocational education.

B. Empirical Indicators of Program Outcomes

One of the information elements that is of crucial importance in an evaluative outcome study is data on program results. Oetting and Cole (1978) identify faulty outcome measurement as the most likely source of failure in any program evaluation. They further remind us that you cannot make up for poor execution at one step in the evaluation process (e.g., data collection) by excellence in another (e.g., data analysis). The steps are multiplicative; the quality of an evaluation study is the product of interaction among all the parts.

In vocational education evaluation, a number of data problems exist. Some of these were identified and illustrated in earlier reports (Darcy, 1979a; Bolland, 1979). During the past year, the National Center published two state-of-the-art papers dealing specifically with data issues. Hopkins (1979) describes vocational education data needs, types, and sources, listing as primary sources of evaluative data the U.S. Bureau of Labor Statistics, State Employment Security Agencies, and State Departments of Education. Lee (1979) raises questions about the extent to which vocational education administrators use evaluative data and identifies a number of conditions that must be met before such data will in fact be used. A third state-of-the-art paper (Grasso, 1979) alludes to shortcomings of data on training-related placement. The National Center's report on the status of vocational education (1978) deals at length with data problems and prospects for improvements in the data base.

In the present study, the staff was committed to using only existing data. Although questions were raised about methods of collection, reporting, and state-level analysis, the scope of work did not include intensive probing of state data systems or field audits (Darcy, 1979b). The staff wishes to emphasize, however that without adequate and accurate data no valid empirical study of vocational education outcomes is possible.

C. Standards for Interpreting Outcome Data

The issue of evaluation standards was addressed in an earlier report (Darcy, 1979a). Efforts have been made to underscore the nature of evaluation standards and their role in conducting bona fide evaluation studies as opposed to simple descriptive reports. The meaning of "standard" in the context of educational evaluation, as pointed out by Anderson et al. (1975), conforms to a dictionary definition: "a degree or level of requirement, excellence, or attainment." The concept can be illustrated with an analogy.

In evaluating the performance of an automobile, one might posit the criterion of fuel efficiency as indicated by the number of miles the car can be driven per gallon of gasoline consumed. Assume that the designated automobile is observed to average twenty-four miles per gallon in freeway driving. Whether this performance is good, bad, or indifferent depends on the standard that is adopted for comparison, e.g., 20.5 miles per gallon. In practice, the search for such a standard might be frustrated by the nonavailability of a car of equal size, weight, and price, or simply by the lack of documented fuel consumption for the comparison car.

In the notes for operationalizing outcomes appearing in Section D, three different evaluation designs are utilized (see entries for Item 7 in "Essential Elements of Information"). Some possible evaluation standards are then suggested (Item 8 entries) that correspond to the respective designs. Various data collection methods are also mentioned (Item 9).

The three designs are (A) Comparison Groups, (B) Before and After, and (C) Case Study. Design A resembles the "nonequivalent control group design" described by Campbell and Stanley (1963). All three designs are described in Borus (1979). In some inquiries there is really no evaluation study at all because no basis for evaluation exists other than intuition or arbitrary judgment (Clarkson, Neuberger, and Koroloff, 1977). Differences among experimental, quasi-experimental, and other research designs are discussed in the books by Campbell and Stanley and by Borus cited above. Covariance analysis and multiple regression techniques used to control statistically for preexisting differences are described in Grasso (1975).

Many of the entries for Item 8 suggest that the performance of vocational students be compared with that of nonvocational students (i.e., college preparatory and general) who have similar characteristics. A good deal of discretion and ingenuity is called for in conjuring up appropriate comparison groups or, instead, developing other types of evaluation standards that make comparison groups unnecessary. One innovative approach to the development of quantitative evaluation standards—exemplified by the unemployment disparity index—is described in Chapter IV

D. Notes for Operationalizing Fifteen Outcomes

Table 4 provides notes for use in operationalizing fifteen possible outcomes of vocational education. These are the same outcomes discussed in Chapter II. As indicated earlier, these outcomes are not purported to be the most important outcomes of vocational education, nor are

they necessarily the fifteen most appropriate or feasible outcomes to use for evaluation purposes. They are outcomes the project staff considers to be significant in themselves and useful for the dual purpose of illustrating (a) diverse types of possible outcomes and (b) different methodological approaches to evaluating vocational education on the basis of outcomes. The "validity" of the particular outcome criteria included in this list was addressed in Chapter II.

It is hoped that these notes will be genuinely useful to evaluators in state and local education agencies as well as suggestive to others interested in outcomes evaluation. We do not, however, pretend that they are detailed enough to take into the field. Many additional hours would be needed to design an evaluation study for any given outcome so that the study would fit a particular time, place, and requirements of the sponsoring agency.

In order to avoid having a table of excessive length and to provide a consistent format that is relatively easy to follow, we have limited the entries to two pages per outcome. For each outcome, information is provided that addresses all fourteen items in the checklist "Essential Elements of Information in an Outcomes Evaluation." The entries in the column headed "Information for this Outcome" are intended to (a) clarify the outcome to be studied, and (b) suggest possible ways to operationalize the outcome for evaluation purposes. Brevity prevails over comprehensiveness in suggesting how to approach the development of an evaluation plan.

For each checklist item, there are numerous potential alternatives. For example, Outcome No. 5 identifies the affected entity (checklist Item #3) as *economically disadvantaged* high school students. A particular local education agency (LEA) might want to know what effect vocational education has on *all* students, disadvantaged and nondisadvantaged alike. The student population can be readily changed to address the more inclusive study. Similarly, Outcome No. 8 refers to the earnings of former vocational students during their first *two years* after leaving school. If the evaluator is interested in determining earnings over a three-year or four-year time period, this modification can be made. Indeed, a fifty-page planning paper could be written on each outcome identifying possible variations in such study elements as the affected entity, program specified as the strategic independent variable, rationale for the hypothesized outcome, empirical indicators, data requirements, time framework, evaluation standards, etc.

The specificity expressed in some of the notes is intended to suggest that evaluation studies require particular definitions and delimitations of some kind in order for the evaluation plan to be operational. What is required is a rifle approach, not a shotgun approach. But there are many possible targets.

While Table 4 does not fully operationalize the fifteen outcomes, it does carry the process a step or two beyond identifying outcomes and simply listing a set of general evaluation procedures. The task of designing a completely operationalized evaluation study, however, is left to state and local education agencies or other evaluators based on their particular interests, resources, and needs.

A list of abbreviations used in the table appears at the end of the table. In a few cases material is carried over into the end notes, and for each outcome two or more literature references are provided. The notes are designated by numbers (corresponding to the number of the outcome) and by letter ("a" for the first note applying to a particular outcome, "b" for the second, and so on)

Table 4

SOME KEY OUTCOMES FOR USE IN EVALUATING VOCATIONAL EDUCATION PROGRAMS

(Table begins on following page)

Table 4. **SOME KEY OUTCOMES FOR USE IN EVALUATING**

OUTCOME NO. 1	• IMPROVING BASIC EDUCATIONAL SKILLS	
ESSENTIAL ELEMENTS OF INFORMATION FOR AN EVALUATION STUDY		
	Checklist of Elements	Information for This Outcome*
(1)	Outcome question to be answered:	To what extent do students enrolled in vocational programs improve their basic educational skills (communications and numerical calculation)?
(2)	Outcome hypothesized as the dependent variable:	Improvement of basic educational skills.
(3)	Affected entity (student population or other entity in which the outcome is observed):	High school students enrolled in vocational programs at the 10th, 11th, and 12th grade levels.
(4)	Program identified as the strategic independent variable:	Enrollment in an approved vocational program at the 10th, 11th, or 12th grade level for a minimum of two semesters.
(5)	Rationale for hypothesized outcome and appropriateness of the outcome as a basis for evaluating the program:	The practical orientation of vocational studies may make it easier for students with certain characteristics to learn basic educational skills. Students may be more highly motivated to learn in general because of their interest in vocational subjects.
(6)	Empirical indicators of the outcome:	Scores on verbal and quantitative tests.
(7)	Methodological considerations (evaluation design, sampling procedures, statistical analysis):	Comparison-group design with pre- and post-tests; stratified random samples of vocational and other students (sex, race, etc.); statistical tests of the significance of differences.
(8)	Evaluation standard (basis for interpreting outcome data to judge program effectiveness):	Superior performance of vocational students vs. nonvocational students matched as nearly as possible for sex, race/ethnicity, mental ability, socioeconomic background, and quantity of schooling.
(9)	Data requirements (instruments, procedures, data base):	Background data and test scores for samples of program population and comparison group.

	Checklist of Elements	Information for This Outcome*
(10)	Feasibility of investigating this outcome (conceptual, administrative, cost, time, other considerations):	Potentially this outcome is highly feasible since the required data are routinely collected by most LEAs for all students. Additional costs for data analysis should be low. Administrative cooperation would be required between vocational and nonvocational departments. Some vocational officials could be reluctant to cooperate in the study because they feel that the outcome is not an appropriate evaluation criterion for vocational education.
(11)	Findings (results of data analysis, warranted inferences, generalizability):	If students having certain characteristics show greater basic educational improvement in a vocational curriculum than in an academic or general program, this fact would stimulate policy makers to re-think the role of vocational education in public education. It would be important to determine whether differential effects are observed by vocational program areas.
(12)	Potential impact of findings (implications for policy, program design and management, image of vocational education):	Positive results overall or for particular program areas would have implications for school counseling and vocational program improvement. It could also help define the basic mission of vocational education. Public support could increase.
(13)	Dissemination of findings and suggested applications:	Findings should be shared with SEAs, NACVE, SACVEs, and RCU network and disseminated through other appropriate channels.
(14)	Implications of findings for further RD&E activities and relationship of this evaluation to previous studies:	Similar studies should be done in a number of SEAs and LEAs, perhaps using different instruments. Procedures and findings should be compared with previous studies, including those based on data from the high school class of 1972.[a]

Notes: * See abbreviations at end of table.
[a] See notes at end of table.

Table 4. SOME KEY OUTCOMES FOR USE IN EVALUATING

OUTCOME NO. 2	• DEVELOPMENT OF USEFUL OCCUPATIONAL SKILLS	
ESSENTIAL ELEMENTS OF INFORMATION FOR AN EVALUATION STUDY		
	Checklist of Elements	Information for This Outcome*
(1)	Outcome question to be answered:	Do students acquire useful occupational skills by participating in school-based vocational programs?
(2)	Outcome hypothesized as the dependent variable:	Development of useful occupational skills.
(3)	Affected entity (student population or other entity in which the outcome is observed):	Students who have completed at least 50 percent of an approved high school vocational program during a specified time period.
(4)	Program identified as the strategic independent variable:	Completion of at least 50 percent of an approved high school vocational program (i.e., sequence of courses and related experiences approved by the state vocational education agency).
(5)	Rationale for hypothesized outcome and appropriateness of the outcome as a basis for evaluating the program:	Vocational programs provide instruction in a variety of occupational skills presumed to be useful for today's jobs, especially in entry-level employment. While acknowledging other potential benefits of vocational education, many people regard the development of occupational skills as the central focus of the curriculum and the outcome over which the school has the greatest control.
(6)	Empirical indicators of the outcome:	Cognitive competencies and performance of a valid sample of tasks that entry-level workers are required to do in particular occupations.
(7)	Methodological considerations (evaluation design, sampling procedures, statistical analysis):	Before-and-after design. Random samples can be drawn from high school students enrolled in one or more (a) occupational areas, (b) schools, (c) local school systems, (d) states. Statistical tests of the significance of gains.
(8)	Evaluation standard (basis for interpreting outcome data to judge program effectiveness):	Attainment of significant gain scores and post scores that achieve minimum performance required for entry-level workers.

	Checklist of Elements	Information for This Outcome*
(9)	Data requirements (instruments, procedures, data base):	Scores on standardized occupational skill performance tests or proxies for them (e.g., written tests intended to measure skills indirectly) and judgments by vocational instructors and employer panels on scores required for minimum entry-level performance.
(10)	Feasibility of investigating this outcome (conceptual, administrative, cost, time, other considerations):	In the absence of valid standardized performance tests, data will be highly judgmental (subject to bias and other types of error), thereby undermining credibility of the findings. Administrative burdens could be substantial. Lack of conceptual basis for comparing vocational vs. nonvocational students in terms of the outcome variable makes it difficult to identify an appropriate evaluation standard.
(11)	Findings (results of data analysis, warranted inferences, generalizability):	Do the outcome data indicate that students acquire useful occupational skills by participating in high school vocational programs and, if so, to what extent? Can the findings be generalized to other populations?
(12)	Potential impact of findings (implications for policy, program design and management, image of vocational education):	Credible evidence that youth acquire useful occupational skills through high school vocational programs will demonstrate a tangible outcome, the value of which depends on labor market conditions and other factors largely beyond control of the schools.
(13)	Dissemination of findings and suggested applications:	Findings should be shared with SEAs, NACVE, SACVEs, and RCU network and disseminated through other appropriate channels.
(14)	Implications of findings for further RD&E activities and relationship of this evaluation to previous studies:	The study should be replicated with the same and also other (a) occupational programs and (b) SEAs and LEAs. Emphasis should be placed on developing effective data-collection instruments and procedures.[a]

Notes: * See abbreviations at end of table.
[a] See notes at end of table.

Table 4. **SOME KEY OUTCOMES FOR USE IN EVALUATING**

OUTCOME NO. 3	• REDUCING THE RISK OF UNEMPLOYMENT FOR MINORITY YOUTH

ESSENTIAL ELEMENTS OF INFORMATION FOR AN EVALUATION STUDY

	Checklist of Elements	Information for This Outcome*
(1)	Outcome question to be answered:	Does completion of a high school vocational program reduce the risk of unemployment for minority youth?
(2)	Outcome hypothesized as the dependent variable:	Reduction in the risk of unemployment.
(3)	Affected entity (student population or other entity in which the outcome is observed):	Minority youth who completed a high school vocational program and were labor force participants half a year later.
(4)	Program identified as the strategic independent variable:	Completion of an approved vocational program at the secondary level during a specified school year.
(5)	Rationale for hypothesized outcome and appropriateness of the outcome as a basis for evaluating the program:	Since vocational programs provide instruction in occupational skills and afford other employment-related experiences, it is presumed that students will acquire capabilities that make them more attractive to employers. Job-readiness is a desired characteristic of vocational program completers.
(6)	Empirical indicators of the outcome:	Unemployment rate calculated for the program population (i.e., number unemployed as a percentage of the active labor force). This indicates the statistical probability of an "average" worker in the program population being unemployed.
(7)	Methodological considerations (evaluation design, sampling procedures, statistical analysis):	Comparison group design. Sampling procedure as used in SVEA information system. Calculation of confidence intervals for unemployment rates.
(8)	Evaluation standard (basis for interpreting outcome data to judge program effectiveness):	Lower calculated unemployment rate for the program population than for one or more comparison groups.
(9)	Data requirements (instruments, procedures, data base):	Labor force status of the program population and comparison group (or proxy) approximately six to eight months following the end of the school year.

	Checklist of Elements	Information for This Outcome*
(10)	Feasibility of investigating this outcome (conceptual, administrative, cost, time, other considerations):	Unemployment rate of program population can be calculated from existing data, although the accuracy of reporting may be uncertain. Unless special survey data are available or can be collected, the comparative evaluation standard will be of limited validity. The relative importance of the outcome itself may be questioned in some SEAs and LEAs.
(11)	Findings (results of data analysis, warranted inferences, generalizability):	Do unemployment rates of the program population and comparison group indicate differences that can be attributed to program completion? Can the findings be generalized to other populations?
(12)	Potential impact of findings (implications for policy, program design and management, image of vocational education):	Lower unemployment rates for vocational completers would suggest school-based vocational education may be an effective policy to reduce minority youth unemployment and should be extended to more students. Finding no difference or higher rates suggests a need to determine why.
(13)	Dissemination of findings and suggested applications:	Findings should be shared with SEAs, NACVE, SACVEs, and RCU network and disseminated through other appropriate channels.
(14)	Implications of findings for further RD&E activities and relationship of this evaluation to previous studies:	The study should be replicated in other SEAs and LEAs, with other populations and in other time periods. Procedures and findings should be compared with past studies.[a]

Notes: * See abbreviations at end of table.
[a] See notes at end of table.

Table 4. SOME KEY OUTCOMES FOR USE IN EVALUATING

OUTCOME NO. 4	• ACQUISITION OF WORLD-OF-WORK KNOWLEDGE	
ESSENTIAL ELEMENTS OF INFORMATION FOR AN EVALUATION STUDY		
	Checklist of Elements	Information for This Outcome*
(1)	Outcome question to be answered:	Do vocational students acquire greater world-of-work knowledge than comparable nonvocational students?
(2)	Outcome hypothesized as the dependent variable:	Acquisition of world-of-work knowledge.
(3)	Affected entity (student population or other entity in which the outcome is observed):	Students who have completed a minimum of one and one-half semesters of high school or postsecondary occupational education.
(4)	Program identified as the strategic independent variable:	Completion of at least one and one-half semesters of a vocational program at the high school level or in a postsecondary vocational-technical institute, community college, or other postsecondary, nonbaccalaureate institution.
(5)	Rationale for hypothesized outcome and appropriateness of the outcome as a basis for evaluating the program:	In its efforts to enhance the employability, productivity, and earnings of students, vocational education is typically concerned with a wider range of employment-related topics than occupational skills alone. One of these can be termed "world-of-work knowledge," which includes: occupational information, career planning, knowledge of labor market processes, job-search strategies, and work-adjustment skills. There is some research evidence indicating that labor market outcomes are influenced by factors such as these. Vocational programs may be expected to generate higher levels of world-of-work knowledge than academic programs, which focus on other educational objectives.
(6)	Empirical indicators of the outcome:	Scores on cognitive tests of occupational information, job-search methods, and labor market processes; and performance of tasks in the areas of decision making, job interviewing, career planning, and work adjustment.
(7)	Methodological considerations (evaluation design, sampling procedures, statistical analysis):	Comparison-group design. Stratified random samples of program population and comparison group. Statistical tests of the significance of differences.

	Checklist of Elements	Information for This Outcome*
(8)	Evaluation standard (basis for interpreting outcome data to judge program effectiveness):	Superior performance of vocational students vs. nonvocational students matched as nearly as possible for race/ethnicity, mental ability, socio-economic background, sex, quantity of schooling, and work experience.
(9)	Data requirements (instruments, procedures, data base):	Scores on cognitive and performance tests as well as background data will be required on students in program and comparison groups. Existing instruments such as the NLS occupational information test can perhaps be used. Procedures for assessing performance can be developed (drawing on CETA models).
(10)	Feasibility of investigating this outcome (conceptual, administrative, cost, time, other considerations):	This outcome ranks lower in feasibility than some others because (a) the meaning attached to the outcome is neither completely clear nor accepted, (b) valid instruments are not readily available, and (c) it may be difficult to generate data for a satisfactorily matched comparison group.
(11)	Findings (results of data analysis, warranted inferences, generalizability):	Positive findings can be interpreted as evidence that vocational programs generate employment-related benefits beyond the development of occupational skills, which are sometimes alleged to be narrow and obsolescent-prone.
(12)	Potential impact of findings (implications for policy, program design and management, image of vocational education):	Such a finding might encourage high schools to strengthen the world-of-work-information component of their nonvocational programs. If vocational students do not compare favorably in world-of-work knowledge, the objectives and processes should be reviewed to determine what program changes, if any, should be made.
(13)	Dissemination of findings and suggested applications:	Findings should be shared with SEAs, NACVE, SACVEs, and RCU network and disseminated through other appropriate channels.
(14)	Implications of findings for further RD&E activities and relationship of this evaluation to previous studies:	The study should be replicated. Instruments and procedures should be critiqued and improved reflecting increased understanding of the outcome. Comparison could be made with the NLS findings and other studies.[a]

Notes: * See abbreviations at end of table.
[a] See notes at end of table.

Table 4. SOME KEY OUTCOMES FOR USE IN EVALUATING

OUTCOME NO. 5 • EDUCATIONAL COMMITMENT AT THE HIGH SCHOOL LEVEL		
ESSENTIAL ELEMENTS OF INFORMATION FOR AN EVALUATION STUDY		
	Checklist of Elements	Information for This Outcome*
(1)	Outcome question to be answered:	Does enrollment in a vocational program strengthen the educational commitment of economically disadvantaged students at the high school level?
(2)	Outcome hypothesized as the dependent variable:	Educational commitment of economically disadvantaged students.
(3)	Affected entity (student population or other entity in which the outcome is observed):	Economically disadvantaged high school students who enroll in a vocational program.
(4)	Program identified as the strategic independent variable:	Enrollment in an approved vocational program at the 10th, 11th, or 12th grade level and attendance of at least 60 percent of vocational classes during the first four weeks.
(5)	Rationale for hypothesized outcome and appropriateness of the outcome as a basis for evaluating the program:	By teaching entry-level occupational skills, vocational programs offer students the prospect of employment, earnings, and economic self-reliance in the near future. The immediacy of this return[a]
(6)	Empirical indicators of the outcome:	School attendance, grades, quantity of schooling completed, graduation rates, and attitudinal indicators.
(7)	Methodological considerations (evaluation design, sampling procedures, statistical analysis):	Comparison-group and before-and-after design. Stratified random samples of economically disadvantaged students by enrollment in vocational education or general/college preparatory curricula. Statistical tests of differences between the two groups and within the vocational group, before and after enrollment.
(8)	Evaluation standard (basis for interpreting outcome data to judge program effectiveness):	Superior attendance, grades, quantity of schooling completed, graduation rates, and attitudes towards school, work, and life of vocational students vs. nonvocational students.
(9)	Data requirements (instruments, procedures, data base):	Data required on student background, participation in vocational education, and outcome indicators listed in (6) above.

	Checklist of Elements	Information for This Outcome*
(10)	Feasibility of investigating this outcome (conceptual, administrative, cost, time, other considerations):	This evaluation study would require substantial staff resources, time (longitudinal data over a period of two or three years), and strong administrative support. Without these elements, its feasibility is questionable.
(11)	Findings (results of data analysis, warranted inferences, generalizability):	Finding that enrollment in vocational education strengthens the educational commitment of high school students would document an outcome of broader significance than job placement and other immediate labor market benefits. Graduation from high school is socially and economically valuable per se and also is typically a requirement for postsecondary education, including pursuit of a baccalaureate degree.
(12)	Potential impact of findings (implications for policy, program design and management, image of vocational education):	Positive findings would strengthen the reputation of vocational education as an effective alternative to the academic and general high school curricula. Differential outcomes by vocational program area could suggest ways of improving various programs.
(13)	Dissemination of findings and suggested applications:	Procedures and findings could be shared with evaluators in other LEAs and SEAs, and results could be reported in professional journals and public media.
(14)	Implications of findings for further RD&E activities and relationship of this evaluation to previous studies:	The study should be replicated in other school systems. Differential outcomes by program area, sex, age, and race/ethnicity should be studied in greater depth.[b]

Notes: * See abbreviations at end of table.
[a] Continued at end of table.
[b] See notes at end of table.

Table 4. SOME KEY OUTCOMES FOR USE IN EVALUATING

OUTCOME NO 6	• DEVELOPMENT OF LEADERSHIP QUALITIES	
ESSENTIAL ELEMENTS OF INFORMATION FOR AN EVALUATION STUDY		
	Checklist of Elements	Information for This Outcome*
(1)	Outcome question to be answered:	Does enrollment in a high school vocational program promote the development of leadership qualities?
(2)	Outcome hypothesized as the dependent variable:	Development of leadership qualities.
(3)	Affected entity (student population or other entity in which the outcome is observed):	Students who for one school year or more, at the secondary level, (a) were enrolled in an approved vocational program and (b) actively participated in a vocational student organization (VSO).
(4)	Program identified as the strategic independent variable:	The combination of enrollment in a high school vocational program and participation in a VSO as specified in (3) above.
(5)	Rationale for hypothesized outcome and appropriateness of the outcome as a basis for evaluating the program:	Many vocational students are encouraged to join and become actively involved in VSOs. These groups provide opportunities for social interaction, occupationally related activities, and organizational experience for students outside the classroom. There is an atmosphere of friendliness and security fostered by homogeneity of occupational interests. The need for student leaders to carry out activities of the organizations creates practical opportunities for leadership development. VSOs may afford special leadership opportunities for minority and female students.
(6)	Empirical indicators of the outcome:	Activities and achievements identified by experts as evidence of leadership qualities.
(7)	Methodological considerations (evaluation design, sampling procedures, statistical analysis):	Retrospective case study design. Purposive sample designed to overrepresent high achievers; stratified by occupational fields, race/ethnicity, sex, and age (e.g., 16-19 years, 20-24, 25-35, over 35). Major reliance will be placed on non-statistical analyses of differences.
(8)	Evaluation standard (basis for interpreting outcome data to judge program effectiveness):	Interpretation of overall results will rely on a judgment about the leadership qualities attained due to participation in high school vocational programs. Comparisons can be made among the various subgroups.

	Checklist of Elements	Information for This Outcome*
(9)	Data requirements (instruments, procedures, data base):	Background information and data on leadership experiences and achievements of the program students will be required.
(10)	Feasibility of investigating this outcome (conceptual, administrative, cost, time, other considerations):	Use of the case study method makes this outcome administratively feasible, although it could be quite costly if the scope of the study is broad. Credibility could be a problem. In the absence of an experimental or comparison-group design, positive findings may not be convincing to some audiences.
(11)	Findings (results of data analysis, warranted inferences, generalizability):	Within the vocational education community it is assumed on faith that leadership skills and self-image are notably enhanced through participation in student organizations. Documentation of this outcome would not only have value per se but also would illustrate the evaluation of vocational programs on the basis of an outcome that is quite different from job placement.
(12)	Potential impact of findings (implications for policy, program design and management, image of vocational education):	Positive findings could demonstrate that vocational education generates outcomes beyond individual labor market benefits. Such findings might influence both policy and program planning.
(13)	Dissemination of findings and suggested applications:	Success stories, including cases involving women and minorities, could be used to generate feature articles for newspapers, magazines, and other media. Findings could be disseminated through advisory councils and professional associations to expand awareness of vocational education as a mechanism for promoting upward mobility.
(14)	Implications of findings for further RD&E activities and relationship of this evaluation to past studies:	The studies could be replicated by SEAs and LEAs with emphasis on their own personnel. Methods might be developed to provide a basis for comparing the leadership effects of vocational programs with those of another program experience. Particular components could be examined to determine how they did or did not contribute to affective, cognitive, and behavioral aspects of leadership. The case study methodology could be applied to other outcomes that are not conducive to statistical design.[a]

Notes * See abbreviations at end of table.
[a] See notes at end of table.

Table 4. SOME KEY OUTCOMES FOR USE IN EVALUATING

OUTCOME NO. 7	• POSTSECONDARY EDUCATIONAL SUCCESS	
ESSENTIAL ELEMENTS OF INFORMATION FOR AN EVALUATION STUDY		
	Checklist of Elements	Information for This Outcome*
(1)	Outcome question to be answered:	What effect does completion of a high school vocational program have on access to and success in various forms of postsecondary education and training?
(2)	Outcome hypothesized as the dependent variable:	Success in postsecondary education and training.
(3)	Affected entity (student population or other entity in which the outcome is observed):	Recent high school graduates who completed a high school vocational program and either (a) were admitted to or (b) unsuccessfully sought admission to postsecondary education or training.
(4)	Program identified as the strategic independent variable:	Completion of an approved high school vocational program and graduation from high school within the past six years.
(5)	Rationale for hypothesized outcome and appropriateness of the outcome as a basis for evaluating the program:	Unlike the college preparatory curriculum, the major purpose of vocational education is not to prepare students for entry into postsecondary educational programs. Many vocational students, however, expect to pursue their schooling or training beyond high school and in fact do so, whether in a community college, technical institute, four-year college or university, or apprenticeship program.[a]
(6)	Empirical indicators of the outcome:	Admission rates, grades, and completion rates.
(7)	Methodological considerations (evaluation design, sampling procedures, statistical analysis):	Comparison-group design. Stratified random samples of vocational completers/graduates and graduates of other high school curricula. Statistical tests of the significance of differences.
(8)	Evaluation standard (basis for interpreting outcome data to judge program effectiveness):	Admission rates, grades, and completion rates for a sample of recent high school vocational graduates (controlled for age, sex, race/ethnicity, socioeconomic factors) that are (a) not lower than for nonvocational graduates with respect to baccalaureate programs and (b) higher than nonvocational graduates in nonbaccalaureate programs.

	Checklist of Elements	Information for This Outcome*
(9)	Data requirements (instruments, procedures, data base):	Data from student interviews and school records as specified in (8) above.
(10)	Feasibility of investigating this outcome (conceptual, administrative, cost, time, other considerations):	This study is administratively feasible but will require a minimum of one year to collect longitudinal data and will be costly (because of student interviews and examination of school records).
(11)	Findings (results of data analysis, warranted inferences, generalizability):	If it is found that vocational education contributes to student success in postsecondary occupational education and does not inhibit success in four-year postsecondary programs, this will be seen as an important outcome. Such a finding would refute the assumption that high school vocational education tracks students irreversibly into subprofessional careers by limiting their access to college.
(12)	Potential impact of findings (implications for policy, program design and management, image of vocational education):	Findings as described in (11) could tend to increase vocational enrollments at the high school level, attracting more students who may be planning to enter a four-year college. This could undermine the traditional mission of vocational education, to prepare students for entry-level job placement in a field related to their training. Evidence that refutes the "tracking" criticism could therefore induce changes in admission standards, program goals, and accountability criteria.
(13)	Dissemination of findings and suggested applications:	Findings should be shared with the RCU network and disseminated through other appropriate channels.
(14)	Implications of findings for further RD&E activities and relationship of this evaluation to previous studies:	Similar studies should be done in other SEAs and LEAs. Data-collection methods should be varied. Studies could focus on differential effects of particular vocational program areas and on longer time spans.[b]

Notes: * See abbreviations at end of table.
[a] Continued at end of table.
[b] See notes at end of table.

Table 4. SOME KEY OUTCOMES FOR USE IN EVALUATING

HYPOTHESIZED OUTCOME NO. 8		• HIGHER EARNINGS
ESSENTIAL ELEMENTS OF INFORMATION FOR AN EVALUATION STUDY		
	Checklist of Elements	Information for This Outcome*
(1)	Outcome question to be answered:	What effect does vocational education have on the earnings of young workers during their first two years after leaving school?
(2)	Outcome hypothesized as the dependent variable:	Higher earnings than would have been forthcoming if the student had not enrolled in a vocational program.
(3)	Affected entity (student population or other entity in which the outcome is observed):	Students who completed 50 percent or more of an approved vocational program (high school or postsecondary) during a specified time period, whether they subsequently graduated or dropped out.
(4)	Program identified as the strategic independent variable:	Completion of 50 percent or more of an approved vocational program (i.e., sequence of courses and related experiences approved by the SVEA).
(5)	Rationale for hypothesized outcome and appropriateness of the outcome as a basis for evaluating the program:	Vocational programs purport to teach job skills and prepare students for productive employment. In a market economy, workers with superior skills are assumed to be more productive and to earn more than those who are less skilled. Occupational training should give vocational students an early labor market advantage over comparable students who have not had job-related training.
(6)	Empirical indicators of the outcome:	Hourly wages as of particular time periods (e.g., eight months after leaving school and again sixteen months later).
(7)	Methodological considerations (evaluation design, sampling procedures, statistical analysis):	Comparison-group design. Stratified random samples can be drawn from program population in different occupational areas, schools, and labor markets, excluding persons who received more than 80 hours of postschool training to qualify for job assignment. Statistical tests will be performed to determine significance of differences in hourly wages.
(8)	Evaluation standard (basis for interpreting outcome data to judge program effectiveness):	Higher mean hourly wages of the program population than for a group of workers having characteristics similar in all respects except that they did not participate in vocational education.

	Checklist of Elements	Information for This Outcome*
(9)	Data requirements (instruments, procedures, data base):	Background information on program population and comparison group plus hourly earnings data for a given time period and given labor market areas. One possible source of wage data is the self-reporting follow-up survey conducted by LEAs under VEDS. These data could be verified with employers for a sample of respondents.
(10)	Feasibility of investigating this outcome (conceptual, administrative, cost, time, other considerations):	All aspects of this investigation appear highly feasible with the possible exception of comparison group data. An alternative evaluation standard might have to be used based on general labor force statistics.
(11)	Findings (results of data analysis, warranted inferences, generalizability):	Observation and statistical analysis of the designated empirical indicator will provide a partial answer to the outcome question. Generalization beyond the labor market area studied would not be warranted.
(12)	Potential impact of findings (implications for policy, program design and management, image of vocational education):	Positive findings would contradict many national studies, which report no earnings advantage for former vocational students. They would suggest that the local program "pays off" and may be superior to vocational programs in some other states.
(13)	Dissemination of findings and suggested applications:	Findings should be shared with SEAs, NACVE, SACVEs, and RCU network and disseminated through other appropriate channels.
(14)	Implications of findings for further RD&E activities and relationship of this evaluation to previous studies:	Since this outcome will be studied in all states as part of VEDS, good opportunities will exist for comparing data-collection procedures, responses, and interpretations of results. The methodology and findings should also be compared with previous national studies to determine why the results differed.[a]

Notes: * See abbreviations at end of table.
[a] See notes at end of table.

Table 4. SOME KEY OUTCOMES FOR USE IN EVALUATING

OUTCOME NO. 9	• STUDENT SATISFACTION WITH SCHOOL	
ESSENTIAL ELEMENTS OF INFORMATION FOR AN EVALUATION STUDY		
	Checklist of Elements	Information for This Outcome*
(1)	Outcome question to be answered:	Do students enrolled in vocational programs express more, less, or the same satisfaction with their current school experience as comparable nonvocational students?
(2)	Outcome hypothesized as the dependent variable:	Student satisfaction with current school experience, whether high school or postsecondary.
(3)	Affected entity (student population or other entity in which the outcome is observed):	Students currently enrolled in an occupational curriculum, whether at the secondary or postsecondary level.
(4)	Program identified as the strategic independent variable:	Enrollment in a school-based vocational program, whether secondary or postsecondary.
(5)	Rationale for hypothesized outcome and appropriateness of the outcome as a basis for evaluating the program:	Outcomes selected as criteria for evaluating vocational programs typically have an investment orientation rather than a focus on direct satisfaction to students.[a] Student satisfaction with school is an outcome that has direct consumer value, particularly to the individual student, as well as indirect investment-type benefits through its motivational effects on quality and quantity of school achievement. U.S. society values the pursuit of happiness and quality of life. Since schooling occupies a central place in the lives of young people, the enjoyment they derive from school is an appropriate criterion, among others, for evaluating the school program.
(6)	Empirical indicators of the outcome:	Responses to attitudinal questions that directly and indirectly measure satisfaction with various facets of the current school experience.
(7)	Methodological considerations (evaluation design, sampling procedures, statistical analysis):	Comparison-group design. Stratified random samples of secondary and postsecondary students in a given state or local community.
(8)	Evaluation standard (basis for interpreting outcome data to judge program effectiveness):	More positive attitudes held by vocational students than by nonvocational students, at secondary and postsecondary levels, matched for sex, age, mental ability, and socioeconomic background.

	Checklist of Elements	Information for This Outcome*
(9)	Data requirements (instruments, procedures, data base):	Background data and questionnaire responses required for vocational students and comparison groups. Possible use of NLS instruments.
(10)	Feasibility of investigating this outcome (conceptual, administrative, cost, time, other considerations):	Using a relatively naive design, this study is highly feasible both administratively and in terms of cost. If a methodologically sophisticated study is undertaken, administrative problems and costs will escalate. In either case, questions will arise with respect to the validity of questionnaire items, matching of vocational vs. nonvocational students, and the basic rationale for valuing student satisfaction.
(11)	Findings (results of data analysis, warranted inferences, generalizability):	There is a great deal of uncertainty and disagreement among educators, legislators, and the general public regarding the purposes and desirable outcomes of education. A finding that vocational students enjoy what they are studying more than they would enjoy alternative educational programs (regardless of whether vocational programs generate labor market benefits) would generally be regarded as a positive outcome.
(12)	Potential impact of findings (implications for policy, program design and management, image of vocational education):	Positive findings could increase student interest in vocational education and public support for expansion of the program.
(13)	Dissemination of findings and suggested applications:	Share instruments, procedures, and results with other SEAs and LEAs. Other dissemination dependent on credibility of the study and nature of findings.
(14)	Implications of findings for further RD&E activities and relationship of this evaluation to previous studies:	Compare findings and methodology with previous studies and explain important differences. Replicate in other states and local communities. Examine in depth the programmatic and other correlates of high satisfaction.[b]

Notes: * See abbreviations at end of table.
[a,b] See notes at end of table.

Table 4. SOME KEY OUTCOMES FOR USE IN EVALUATING

OUTCOME NO. 10		• REDUCTION OF JOB-SEARCH TIME
ESSENTIAL ELEMENTS OF INFORMATION FOR AN EVALUATION STUDY		
	Checklist of Elements	Information for This Outcome*
(1)	Outcome question to be answered:	What effect does vocational education have on the length of time it takes young workers to find full-time employment after leaving high school?
(2)	Outcome hypothesized as the dependent variable:	Reduction of job-search time.
(3)	Affected entity (student population or other entity in which the outcome is observed):	Recent high school leavers (whether graduates or dropouts) who completed a minimum of one full semester of an approved vocational program and entered the labor force seeking full-time employment immediately after leaving school.
(4)	Program identified as the strategic independent variable:	Completion of one semester or more of an approved high school vocational program.
(5)	Rationale for hypothesized outcome and appropriateness of the outcome as a basis for evaluating the program:	Development of occupational skills and exposure to world-of-work information and experiences as a participant in vocational education can be expected to enhance the job-seeking ability of young workers. The length of time it takes to find a job is one test of this ability. Vocational programs often provide direct assistance in job placement. Assuming compensation at the federal minimum wage of $3.10 per hour, the economic value of reducing job-search time for vocational students by as little as two weeks would be $248. This amount represents a significant benefit of vocational education.
(6)	Empirical indicators of the outcome:	Number of days (weeks) spent searching for employment after leaving school, i.e., from date of leaving school to date of securing regular, full-time employment, not first day at work on the job. (Students hired for a regular, full-time job before leaving school will have zero job-search time as here defined.)
(7)	Methodological considerations (evaluation design, sampling procedures, statistical analysis):	Comparison-group design. Stratified random samples of former vocational students and comparable former nonvocational students. Statistical tests of the significance of differences.

	Checklist of Elements	Information for This Outcome*
(8)	Evaluation standard (basis for interpreting outcome data to judge program effectiveness):	Less time spent by vocational students searching for a job as here defined than by nonvocational students.
(9)	Data requirements (instruments, procedures, data base):	Background data from school records and job-search time and supplementary information reported by students in the sample. Use might be made of data from the new youth cohort of the National Longitudinal Surveys (NLS), but supplementary interview questions would be required to distinguish clearly between time spent in voluntary idleness versus involuntary unemployment.[a]
(10)	Feasibility of investigating this outcome (conceptual, administrative, cost, time, other considerations):	Unless existing data are used, such as the new NLS youth cohort (which itself may not be fully adequate for purposes of this particular type of search-time study), the costs of this study would be substantial.
(11)	Findings (results of data analysis, warranted inferences, generalizability):	A finding that vocational education reduces job-search time will be seen as a documented labor market benefit.
(12)	Potential impact of findings (implications for policy, program design and management, image of vocational education):	Positive findings would reinforce programs that contribute to the enhancement of job-search skills. Nonvocational programs might emulate successful vocational practices.
(13)	Dissemination of findings and suggested applications:	Findings should be shared with RCU network and disseminated through other appropriate channels.
(14)	Implications of findings for further RD&E activities and relationship of this evaluation to previous studies:	The study should be replicated. Instruments and procedures should be critiqued and improved, reflecting increased understanding of the outcome. Comparison could be made with the NLS findings and other studies.[b]

Notes: * See abbreviations at end of table.
[a,b] See notes at end of table.

Table 4. SOME KEY OUTCOMES FOR USE IN EVALUATING

OUTCOME NO. 11		• SATISFACTORINESS TO EMPLOYERS
ESSENTIAL ELEMENTS OF INFORMATION FOR AN EVALUATION STUDY		
	Checklist of Elements	Information for This Outcome*
(1)	Outcome question to be answered:	To what extent do employers consider former vocational students to be well trained and prepared for employment?
(2)	Outcome hypothesized as the dependent variable:	Satisfactoriness of vocational programs as perceived by employers.
(3)	Affected entity (student population or other entity in which the outcome is observed):	Employers of former vocational students (as influenced by performance of employees who took vocational education).
(4)	Program identified as the strategic independent variable:	Secondary and postsecondary vocational programs that purport to impart entry-level job skills.
(5)	Rationale for hypothesized outcome and appropriateness of the outcome as a basis for evaluating the program:	To the extent that vocational programs purporting to teach entry-level job skills are successful, they will turn out program completers and leavers who are likely to be considered by their employers to be well trained and prepared for employment.
(6)	Empirical indicators of the outcome:	Employer ratings of former vocational students. (Legislation specifies the use of employer perceptions as the required empirical indicator.)
(7)	Methodological considerations (evaluation design, sampling procedures, statistical analysis):	Sampling procedure as used in SVEA data system.
(8)	Evaluation standard (basis for interpreting outcome data to judge program effectiveness):	Higher ratings for (a) former vocational students than for comparable workers doing the same jobs who did not take vocational education, or (b) the present cohort of vocational students as compared with earlier cohorts.
(9)	Data requirements (instruments, procedures, data base):	Employer responses to a mail survey at the time of student follow-up. Questionnaire designed by SEA or LEA based on national VEDS, adapted to provide for comparison of vocational students with nonvocational, or supplemented with a second questionnaire to collect data on employees without a vocational background.

	Checklist of Elements	Information for This Outcome*
(10)	Feasibility of investigating this outcome (conceptual, administrative, cost, time, other considerations):	The employer ratings of former vocational students will be easily and inexpensively obtained under established VEDS requirements. Validity of responses may be questioned, including employer comparisons of vocational with nonvocational students. A separate survey of employer perceptions of nonvocational students would be difficult and costly.
(11)	Findings (results of data analysis, warranted inferences, generalizability):	High ratings given by employers to the training and job preparation of the employees can be interpreted as a positive indication of vocational program success. If responses vary by item, school, employer, industry, or occupational program this can identify potential strengths and weaknesses.
(12)	Potential impact of findings (implications for policy, program design and management, image of vocational education):	Findings might demonstrate the need for program improvement and, depending on their nature, serve as a demonstration to the educational community, the public, and policy makers that vocational education does indeed make a difference in preparing youth for jobs.
(13)	Dissemination of findings and suggested applications:	Share procedures, instruments, and results with RCU and advisory council networks. Other dissemination dependent on findings.
(14)	Implications of findings for further RD&E activities and relationship of this evaluation to previous studies:	Since this outcome is addressed by VEDS, good opportunities will exist for comparing data-collection procedures, responses, and interpretations of results.[a]

Notes: * See abbreviations at end of table.
[a] See notes at end of table.

Table 4. SOME KEY OUTCOMES FOR USE IN EVALUATING

OUTCOME NO. 12	• AREA ECONOMIC DEVELOPMENT POTENTIAL	
ESSENTIAL ELEMENTS OF INFORMATION FOR AN EVALUATION STUDY		
	Checklist of Elements	Information for This Outcome*
(1)	Outcome question to be answered:	What effect does vocational education have on the attractiveness of the state or local community as a site for business growth and the location of new industry?
(2)	Outcome hypothesized as the dependent variable:	Enhancement of the area's potential for economic development.
(3)	Affected entity (student population or other entity in which the outcome is observed):	State or local economy. (The study might also investigate net effects, if any, on the national economy as a whole.)
(4)	Program identified as the strategic independent variable:	The existence of a substantial program of high school, postsecondary, and adult vocational education in the area.
(5)	Rationale for hypothesized outcome and appropriateness of the outcome as a basis for evaluating the program:	Vocational education imparts occupational skills to men and women who, for the most part, seek employment with business firms in the private sector. Vocational programs also attempt to develop functional work attitudes and behaviors. All of these factors influence worker productivity, which is a basic determinant of a firm's efficiency. To the extent that vocational education achieves its objectives and also reaches large numbers of workers, industry will find the area more attractive as a site for investment. Vocational education has an appropriate interest in factors that influence employment opportunities for its students.
(6)	Empirical indicators of the outcome:	Statements from a cross-section of organizations and individuals who are knowledgeable regarding factors that influence industrial location and business investment decisions.[a]
(7)	Methodological considerations (evaluation design, sampling procedures, statistical analysis):	Case study design. A purposive sample of respondents will be drawn from business (especially representatives of new and recently expanded firms), government, labor, and academia. Statistical analyses will be limited.

	Checklist of Elements	Information for This Outcome*
(8)	Evaluation standard (basis for interpreting outcome data to judge program effectiveness):	Favorable appraisal of the influence of vocational programs on economic development potential. In the absence of systematic data collection and a rigorous comparison design, the most credible evaluation conclusions might be th: appraisals of relatively objective experts having little or no stake in the nature of the judgments.
(9)	Data requirements (instruments, procedures, data base):	Data describing current and past vocational education program effort; instruments for interviewing or conducting mail surveys to obtain respondents' views on the impact of vocational education.
(10)	Feasibility of investigating this outcome (conceptual, administrative, cost, time, other considerations):	Given (a) the case study design, (b) reliance on judgmental data, and (c) designation of potential rather than actual economic development, this study is quite feasible. However, the findings may not be credible; yet a more ambitious design might produce results of even lower credibility.
(11)	Findings (results of data analysis, warranted inferences, generalizability):	Findings, whether positive or negative, would add to our knowledge of the effects of vocational education on an entity other than individual students, thereby increasing awareness of the range and diversity of possible outcomes.
(12)	Potential impact of findings (implications for policy, program design and management, image of vocational education):	Positive findings could enhance the reputation of vocational education as a program that contributes economic benefits to the area. Other states and local areas might want to re-examine their own vocational programs in the context of economic development. Care should be taken not to claim that benefits accruing to a particular area are necessarily benefits for the nation as a whole.
(13)	Dissemination of findings and suggested applications:	Instruments, procedures, and results should be shared with evaluators in other LEAs and SEAs. Audiences for further dissemination dependent on the nature of the findings.
(14)	Implications of findings for further RD&E activities and relationship of this evaluation to previous studies:	Since this study is basically exploratory, it could generate a number of testable hypotheses for future research. Innovative procedures and modified instruments should be developed. Emphasis[b]

Notes: * See abbreviations at end of table.
[a] See notes at end of table.
[b] Continued at end of table.

Table 4. SOME KEY OUTCOMES FOR USE IN EVALUATING

OUTCOME NO. 13	• IMPROVING THE OCCUPATIONAL DISTRIBUTION OF MINORITY WORKERS	
ESSENTIAL ELEMENTS OF INFORMATION FOR AN EVALUATION STUDY		
	Checklist of Elements	Information for This Outcome*
(1)	Outcome question to be answered:	What effect does the existence of an extensive vocational education program have on the occupational distribution of minority workers?
(2)	Outcome hypothesized as the dependent variable:	Improvement of the occupational distribution of minority workers.
(3)	Affected entity (student population or other entity in which the outcome is observed):	Employed labor force in a particular labor market area.
(4)	Program identified as the strategic independent variable:	Existence for more than three years of a substantial program of vocational education, preferably at all levels of training (secondary, postsecondary, and adult).
(5)	Rationale for hypothesized outcome and appropriateness of the outcome as a basis for evaluating the program:	To the extent that minority students enroll in vocational programs and find employment in occupations related to their training, changes in the occupational distribution of employment should reflect the pattern of minority participation in vocational training. It is a goal of vocational education and national policy to increase the access of minority workers to a wider range of occupations.[a]
(6)	Empirical indicators of the outcome:	Distribution of (a) vocational enrollments, (b) placements, and (c) employed workers, by occupation and race/ethnicity.
(7)	Methodological considerations (evaluation design, sampling procedures, statistical analysis):	Case study design. Select one or more labor market areas that draw a high proportion of workers from an educational system having a large, well-established vocational program. Descriptive statistics showing occupational distribution of minority and other workers.
(8)	Evaluation standard (basis for interpreting outcome data to judge program effectiveness):	Ratio of minority-to-total enrollment and placements higher than minority-to-total employment would be an indication that vocational education is helping move minority workers toward greater job equality. Comparisons can also be made

	Checklist of Elements	Information for This Outcome*
(8) continued		between labor market areas having similar demographic and economic characteristics but differing in the extent of their vocational programs. Before-and-after comparisons within a given area are possible but would not likely yield valid results since so many factors besides vocational programs affect employment patterns over time.
(9)	Data requirements (instruments, procedures, data base):	Vocational enrollments, job placements, and existing labor force statistics showing the distribution of employed workers by occupation and race/ethnicity.
(10)	Feasibility of investigating this outcome (conceptual, administrative, cost, time, other considerations):	With its use of the case study design, this inquiry appears highly feasible. Existing data can be used. Costs of analysis will be low. Credibility, however, may be questionable, depending on how skillfully the data are represented and the comparison made with the "control" area.
(11)	Findings (results of data analysis, warranted inferences, generalizability):	Positive findings would demonstrate significant labor market benefits accruing to minority workers. This would show that vocational education is an effective mechanism for advancing national policy.
(12)	Potential impact of findings (implications for policy, program design and management, image of vocational education):	Findings described in (11) would counter the allegation that vocational programs fail to serve the needs of minority groups. More minority students might be attracted to vocational education at secondary, postsecondary, and adult levels.
(13)	Dissemination of findings and suggested applications:	Methodology and findings should be shared with RCUs and other evaluators. Findings could be reported in local news media as well as through appropriate national channels.
(14)	Implications of findings for further RD&E activities and relationship of this evaluation to previous studies:	The study should be critiqued and repeated for the "program" area, with variations that address aspects of the study that were criticized. Similar studies should be done in other labor market areas. Where significant differences exist, alternative hypotheses (other than the existence of vocational programs) should be formulated and tested for their explanatory power.[b]
Notes	* See abbreviations at end of table. [a-b] See notes at end of table.	

Table 4. SOME KEY OUTCOMES FOR USE IN EVALUATING

OUTCOME NO. 14	• TRAINING-RELATED EMPLOYMENT	
ESSENTIAL ELEMENTS OF INFORMATION FOR AN EVALUATION STUDY		
	Checklist of Elements	Information for This Outcome*
(1)	Outcome question to be answered:	To what extent do former high school vocational students find employment in occupations related to their training?
(2)	Outcome hypothesized as the dependent variable:	Training-related employment.
(3)	Affected entity (student population or other entity in which the outcome is observed):	Former high school students who completed 50 percent or more of an approved high school vocational program.
(4)	Program identified as the strategic independent variable:	Completion of 50 percent or more of an approved high school vocational program.
(5)	Rationale for hypothesized outcome and appropriateness of the outcome as a basis for evaluating the program:	Vocational programs purportedly are designed to impart entry-level skills in specific occupational areas. It is assumed that possession of these skills will enhance a person's employability in that particular occupation. To the extent that students find jobs in occupations unrelated to their skill training, or do not find jobs at all, it is felt that the training was to some extent wasted. The Education Amendments of 1976 specify that states shall evaluate their vocational programs in part "according to the extent to which program completers and leavers . . . find employment in occupations related to their training."
(6)	Empirical indicators of the outcome:	Labor force status of the former students as of a designated time period (e.g., survey week) approximately eight months after the end of the preceding school year; and occupational attachment of those former students who were observed to be employed as of the survey period.
(7)	Methodological considerations (evaluation design, sampling procedures, statistical analysis):	Case-study design. Random samples of former students in several different vocational program areas. Frequency distribution of individuals who are not employed (by reason, such as continuing their schooling on a full-time basis), are employed in a training related occupation, or are employed in an unrelated occupation.

	Checklist of Elements	Information for This Outcome*
(8)	Evaluation standard (basis for interpreting outcome data to judge program effectiveness):	No quantitative standard seems appropriate for application to the program population overall. Interpretation of outcome data will be judgmental. However, comparisons can be made among particular occupational areas by sex, race, and category (completers vs. early leavers).
(9)	Data requirements (instruments, procedures, data base):	Background and employment data will be required on program students, as described in (6) above.
(10)	Feasibility of investigating this outcome (conceptual, administrative, cost, time, other considerations):	Since follow-up data are routinely collected, this outcome appears highly feasible. Two major problems do exist however. One is the basis for allocating students to the "training-related" and "unrelated" categories. The other relates to the lack of a quantitative evaluation standard.
(11)	Findings (results of data analysis, warranted inferences, generalizability):	Relatively "high" percentages of training-related employment would suggest that specific occupational training is put to effective use, while "low" percentages might imply the opposite. Differences among particular program areas could invite re-examination of the skill content and relevance of the curricula.
(12)	Potential impact of findings (implications for policy, program design and management, image of vocational education):	To the extent that high rates of training-related placement are valued, programs could be revised to incorporate features (e.g., employer participation in curriculum design) associated with the high rates. Resources and enrollment might be allocated among program areas.
(13)	Dissemination of findings and suggested applications:	Teachers, students, counselors, and parents should be informed of reported placement rates by occupational fields. Instruments, procedures, and results should be shared with evaluators in other LEAs and SEAs. Other dissemination to targeted audiences as appropriate.
(14)	Implications of findings for further RD&E activities and relationship of this evaluation to previous studies:	The study should be replicated and expanded to include additional program areas, school systems, and labor markets. Placements could be compared not only with enrollments and completions but also with the number of students who actually[a]

Notes * See abbreviations at end of table
[a] Continued at end of table.

Table 4. SOME KEY OUTCOMES FOR USE IN EVALUATING

OUTCOME NO. 15	• DEVELOPMENT OF CONSUMER SELF-HELP SKILLS	
ESSENTIAL ELEMENTS OF INFORMATION FOR AN EVALUATION STUDY		
	Checklist of Elements	Information for This Outcome*
(1)	Outcome question to be answered:	To what extent do high school vocational students acquire economically valuable consumer self-help skills?
(2)	Outcome hypothesized as the dependent variable:	Development of consumer self-help skills.
(3)	Affected entity (student population or other entity in which the outcome is observed):	Former students who completed one semester or more of an approved high school vocational program.
(4)	Program identified as the strategic independent variable:	Completion of one semester or more of an approved high school vocational program.
(5)	Rationale for hypothesized outcome and appropriateness of the outcome as a basis for evaluating the program:	Vocational programs, including Consumer Homemaking courses, impart knowledge and develop skills that are useful not only on the job but also at home. To the extent that former vocational students can apply these skills in the production of goods or services for the benefit of their own households, they have economic value "in use" if not "in exchange." The dollar value of this production can be estimated on the basis of what the goods or services would cost if they were purchased in the market.
(6)	Empirical indicators of the outcome:	Reports from a survey of former vocational students (confirmed by observation or third-party testimony where feasible) on actual use of skills derived from vocational programs. Estimates of the market value of goods and services produced for household consumption with these skills.
(7)	Methodological considerations (evaluation design, sampling procedures, statistical analysis):	Case-study design. Stratified random samples of former students for several vocational program areas, by year they left school. Statistical analyses of the dollar value of nonmarket production.
(8)	Evaluation standard (basis for interpreting outcome data to judge program effectiveness):	Focusing on a sample of distinctive vocational skills such as automotive mechanics, carpentry, sewing, and electrical arts would make it plausible to assume that vocational students have a clear advantage over nonvocational students in

	Checklist of Elements	Information for This Outcome*
(8) continued		their ability to perform related self-help tasks. The economic value of such skills could be estimated at some reasonable percentage of market value of the goods or services.
(9)	Data requirements (instruments, procedures, data base):	Background data would be required on the vocational students, the courses they took, and uses they made of school-derived vocational skills. Data could be collected in their senior year, one year later, and then four years after that. In order to complete the study in a shorter period of time, data could be collected retrospectively rather than on a longitudinal basis over the five-year period indicated.
(10)	Feasibility of investigating this outcome (conceptual, administrative, cost, time, other considerations):	As a naive-model case study design, this would be feasible at least as an exploratory study or to illustrate specific nonmarket payouts by means of personalized case studies. The cost of interviews would be high. Determining the source of a skill (e.g., school-based vocational program vs. informal learning at home) would be difficult. It does not appear that a satisfactory study could be carried out consistent with classical experimental or quasi-experimental designs.
(11)	Findings (results of data analysis, warranted inferences, generalizability):	If it is found that former vocational students possess school-derived skills and use them to produce economically valuable goods and services for the direct benefit of their own households, this fact will demonstrate a nonmarket ("practical arts") outcome that could expand the framework used for judging vocational education's value. At the present time, vocational education outcomes having nonmarket value are associated primarily with the field of Consumer Homemaking. Regarding other program areas, to the extent that completers and leavers are not placed in jobs related to their training, vocational education might be seen as failing in its mission.
(12)	Potential impact of findings (implications for policy, program design and management, image of vocational education):	While positive findings could increase public appreciation of vocational education's value, they could also create potential conflict. More students might desire to enroll in vocational education in order to acquire the self-help skills but not to prepare for entry-level employment in the particular occupational area.

	Checklist of Elements	Information for This Outcome*
(13)	Dissemination of findings and suggested applications:	Instruments, procedures, and results should be shared with evaluators in other LEAs and SEAs. Other dissemination as appropriate.
(14)	Implications of findings for further RD&E activities and relationship of this evaluation to previous studies:	Since this is essentially an exploratory study, other SEAs and LEAs should be encouraged to vary the procedures and focus on different vocational programs. A similar study could also be done at the postsecondary level, although it is generally assumed that occupational education is more closely tied to expectations for employment in the field of training. Illustrative case studies could be used in developing benefit-cost analyses. Broader survey data might be collected in collaboration with agencies such as the Cooperative Extension Services.[a]

Notes: * See abbreviations at end of table.
[a] See notes at end of table.

Table 4. SOME KEY OUTCOMES FOR USE IN EVALUATING VOCATIONAL EDUCATION PROGRAMS (continued)

Abbreviations:

CETA = Comprehensive Employment and Training Act
LEA = Local Education Agency
NACVE = National Advisory Council on Vocational Education
NLS = National Longitudinal Surveys (Ohio State University)
RCU = Research Coordinating Unit
RD&E = Research, Development, and Evaluation
SACVE = State Advisory Council on Vocational Education
SEA = State Education Agency
SVEA = State Vocational Education Agency
VEDS = Vocational Education Data System (National Center for Education Statistics, U.S. Department of Education)
VSO = Vocational Student Organization

Notes: (Numbers in parentheses refer to outcome numbers.)

(1)a Literature references include Leonard A. Lecht, *Evaluating Vocational Education: Policies and Plans for the 1970s* (New York: Praeger, 1974); and National Assessment of Educational Progress, *Career and Occupational Development Objectives* (Denver: National Assessment of Educational Progress, Education Commission of the States, 1971). None of the thirty-one empirical studies reviewed in Bolland, *Evaluative Bibliography*, cited in Chapter I above, address this outcome.

(2)a None of the empirical studies reviewed in the *Evaluative Bibliography* used performance testing techniques to investigate the extent to which vocational students developed useful occupational skills. However, several studies, including one by the Texas Advisory Council for Vocational Education attempted to assess employer satisfaction with the training and preparation of former vocational students. On this general topic see James R. Sanders and Thomas P. Sachse, Editors, *Problems and Potentials of Applied Performance Testing* (Portland: Northwest Regional Education Laboratory, December 1975); and Janet E. Spirer, *Performance Testing: Issues Facing Vocational Education* (Columbus: National Center for Research in Vocational Education, The Ohio State University, 1980).

(3)a See John T. Grasso and John R. Shea, *Vocational Education and Training: Impact on Youth* (Berkeley: Carnegie Council on Policy Studies in Higher Education, 1979); and Robert H. Meyer and David A. Wise, *High School Preparation and Early Labor Market Experience*, Working Paper No. 342 (Cambridge: National Bureau of Economic Research, May 1979) Studies reviewed in the *Evaluative Bibliography* do not yield clear findings. Neither the Carnegie nor NBER studies cited here indicate clear differences in unemployment rates based on high school curriculum.

(4)a In support of the claim that "knowledge of the world-of-work" pays dividends in the labor market, see Herbert S. Parnes, et al., *Career Thresholds, Vol. 1*, Manpower Research Monograph No. 16 (Washington: U.S. Department of Labor, 1970). Other studies document the production of world-of-work knowledge but do not find that such knowledge leads to higher wages. See Richard V. Kauffman, *A Study of the Educational Production Function* (Ph.D. Dissertation, Department of Economics, Colorado State University; hard copy published on demand by University Microfilms, Ann Arbor, 1974).

(5)a (continued)
from personal investment in schooling would have special appeal to economically disadvantaged youth, for whom high school completion plus two or four years of postsecondary education might seem excessive time to spend before beginning to earn a living. Because of their background and experience, the students may find vocational subjects easier and more interesting than academic courses. This feeling could encourage them to attend school more regularly, study harder, and stay in school rather than drop out. Vocational programs often provide opportunities for students to earn money while still in school, thereby further reinforcing their commitment to complete high school. Educators, employers, and the general public all value high school completion.

(5)b For a brief literature review and a multiple regression analysis of factors associated with school retention, see Robert L. Ellison and David G. Fox, *Biographical and Academic Correlates of High School Completion* (Raleigh: North Carolina Department Public Instruction, 1973). Also see Jerald G. Bachman et al., *Youth in Transition, Volume III: Dropping Out—Problem or Symptom?* (Ann Arbor: Institute for Social Research, University of Michigan, 1971).

(6)a Literature references include Dennis R. Collins, *An Assessment of Benefits Derived from Membership in a Vocational Student Organization in the Vocational, Technical and Adult Education System* (Menomonie, Wisconsin: Center for Vocational, Technical, and Adult Education; University of Wisconsin—Stout, August 1977); James C. Nance, *National Institute on the Role of Youth Organizations in Vocational Education* (Final Report, DHEW project 16. 9-0322, Trenton, NJ, August 1971) and A. A. Clark, *An Analysis of Leadership and Self-Confidence and/or Self-Acceptance Outcomes from Student Participation in Distributive Education Clubs of America* (Ph.D. Dissertation, University of Minnesota, 1978).

(7)a It is sometimes argued that vocational students are at a disadvantage when entering a baccalaureate program, though they may enjoy advantages over students who did not take a vocational program when they choose a two-year occupational program. The concern in the evaluation study is not with the possible effect of high school vocational education on motivation for postsecondary schooling but rather with access to and success in various types of such programs.

(7)b See David S. Bushnell (Editor), *Help Wanted: Articulating Occupational Education at the Post-Secondary Level* (Columbus: Center for Vocational Education, Ohio State University, 1977), and Leonard A. Lecht, *Evaluating Vocational Education: Policies and Plans for the 1970s* (New York: Praeger, 1974) pp. 84 ff

(8)a Several empirical studies of earnings are reported in Bolland, *Evaluative Bibliography*. Also see William J. Conroy, Jr., "Some Historical Effects of Vocational Education at the Secondary Level," *Phi Delta Kappan*, Vol. 61, No. 4 (December 1979) pp. 267-271; and Grasso and Shea, *Vocational Education and Training: Impact on Youth (op. cit.)*.

(9)a According to Coburn, Salem, and Mushkin (1973), educational outcomes can be categorized in terms of investment and consumption characteristics. Investment-type outcomes refer to effects of education on income and employment. Consumer-type outcomes refer to the direct satisfaction of wants that students (and others involved in education) experience as a result of their participation in educational programs. Earning higher wages by using occupational skills on the job is an investment-type outcome; feeling happy about attending vocational courses as opposed to academic classes is a consumption-type outcome.

(9)b See Christopher Jencks et al., *Inequality: A Reassessment of the Effect of Family and Schooling in America* (New York: Basic Books, 1972); and Grasso and Shea, *op. cit.* pp. 14 ff.

(10)a For a description of the National Longitudinal Surveys see Taylor, Darcy, and Bolland, *Vocational Education Outcomes*, *op. cit.*, pp. 24f.

(10)b References include Gerald G. Somers, *The Effectiveness of Vocational and Technical Programs* (Madison: Center for Studies in Vocational and Technical Education, University of Wisconsin, 1971); *Jobseeking Methods Used by American Workers* (Washington: U.S. Department of Labor, Bureau of Labor Statistics, 1975); and Robert G. Wegmann, "Job-Search Assistance Programs: Implications for the Schools," *Phi Delta Kappan*, Vol. 61, No. 4 (December 1979) pp 271 ff.

(11) See Larry L. Smiley, *Employer Satisfaction with the Skills of Vocational Education Graduates in North Dakota* (Grand Forks: Bureau of Educational Research and Services, University of North Dakota, August 1976); Martin Hamburger and Harry E. Wolfson, *1000 Employers Look at Occupational Education* (New York: Board of Education of the City of New York, July 1969); *The Adequacy of Vocational and Technical Education* (Columbia: South Carolina Advisory Council on Vocational Education, February 1976); and *A Program Review of Secondary Vocational Education in Ohio: Job Placement and State Funding*, Staff Report No. 126 (Columbus: Ohio Legislative Services Commission, April 1978). All four of the studies are reviewed in Bolland, *Evaluative Bibliography*.

(12)a (continued)
"Judgmental" information of this type may seem less desirable than data on actual investment, growth rates, and labor productivity. The latter variables, however, are influenced by so many factors that it would be extremely tenuous to attribute causation to the existence of vocational programs. Perceptions of experts might therefore be more valid and credible.

(12)b (continued)
might be placed on particular occupational specialties having the greatest impact on industrial expansion rather than attempting to show impact for vocational education across the board. The capability of the vocational education system to provide quick

retraining and skill upgrading for adults might be worthy of special study. References include Paul V. Braden and Krishan K. Paul, *The Role of Vocational Education in the Nation's Economic Development*, Information Series No. 150 (Columbus: National Center for Research in Vocational Education, 1979); and Don C. Garrison, "Local Articulation Effort: The Tri-County Technical College," pp 11-20 in David S. Bushnell, Editor, *Help Wanted, op. cit.*

(13)a On the job aspirations and vocational education experiences of black people, see Ferman Moody, "The History of Blacks in Vocational Education," and related articles in *VocEd*, Vol. 55, No. 1 (January 1980).

(13)b For general perspective and some historical data on the occupational distribution of black employment, see Andrew F. Brimmer, "Economic Growth and Employment and Income Trends Among Black Americans," in *Jobs for Americans* edited by Eli Ginzberg (Englewood Cliffs, N.J.: Prentice-Hall, 1976). Also see Richard Butler and James J. Heckman, "The Government's Impact on the Labor Market Status of Black Americans: A Critical Review," in *Equal Rights and Industrial Relations*, edited by L.J. Hausman et al. (Madison, Wisconsin: Industrial Relations Research Association, 1977).

(14)a (continued)
seek jobs in training-related areas. Instruments and procedures for determining employment status and training-relatedness should be further developed. The entire retionale for valuing training-relatedness should be reviewed. References include J. Kenneth Little, *Review and Synthesis of Research on the Placement and Follow-up of Vocational Education Students* (Columbus: Center for Vocational and Technical Education, The Ohio State University, 1970); and *The Status of Vocational Education: School Year 1975-1976* (Columbus: National Center for Research in Vocational Education, The Ohio State University, 1978). A number of the outcome studies reviewed in Bolland, *Evaluative Bibliography*, address the subject of training-related job placement.

(15)a Literature references include Kathryn E. Walker and Margaret E. Woods, *Time Use: A Measure of Household Production of Family Goods and Services* (Washington, D.C.: American Home Economics Association, 1976); and Kathryn E. Walker and William H. Gauger, *The Dollar Value of Household Work*, Information Bulletin 60, Consumer Economics and Public Policy No. 5 (Ithaca: Cooperative Extension Services, New York State College of Human Ecology, 1973).

IV. SOME RESULTS FROM PILOT TESTING

Efforts to develop operational procedures for evaluating vocational education on the basis of outcomes included some pilot testing with existing data available from state education agencies. The two states involved in the pilot tests will be referred to in this report as State-A and State-B.

A. Outcome Selected for Testing

In consultation with vocational education officials of the two cooperating states, the project staff selected for testing "Reducing the Risk of Unemployment for Minority Youth" (Outcome No. 3 in Table I above).

Both states involved in the tests have significant minority populations, both regard the general area of labor market outcomes to be highly important for judging the effectiveness of vocational education, and both had the necessary data on vocational students available in their computerized management information systems. Neither the project staff nor the respective states consider this particular labor market outcome to be the most appropriate single criterion for evaluating vocational programs. However, studying this outcome offered certain advantages, including the face-value importance of the outcome, feasibility in terms of data availability, and conceptual clarity. Moreover, if the study could be carried out successfully for the subset of minority students, it would be relatively simple to apply the same procedures to other subsets or to vocational completers in toto.

One reason the pilot test focused on minority completers rather than all completers was to demonstrate vocational education's sensitivity to the plight of young minority workers, for whom national unemployment rates run—depending on age, race/ethnicity, and place of residence—as high as 30-40%. It should be pointed out that the outcome was defined in terms of reducing the risk of unemployment for minority vocational completers, not the effect of vocational education on the state's or nation's aggregate minority youth unemployment rate.

B. Findings and Procedures

Table 5 summarizes data for State-A on program completers, sample size, completers actively participating in the labor force during the follow-up survey period, and unemployment rates calculated for minority completers and all completers. The calculated unemployment rate as of early 1979 for minority completers in State-A was 8.9%. Data for 1978 (not discussed in this report) indicated an unemployment rate of 12.2%.

Table 6 reports similar data for State-B, where only one year's statistics were available. The calculated unemployment rate for minority completers as of early 1979 was 9.8%. It should be noted that the racial/ethnic composition of State-B's minority population differs markedly from that of State-A, dates of the employment-status survey period differed slightly, and the follow-up survey in State-B included 100% of the previous year's completers rather than a sample of the completers as in State-A.

TABLE 5
UNEMPLOYMENT RATES IN EARLY 1979, STATE-A HIGH SCHOOL VOCATIONAL COMPLETERS, MINORITY AND ALL COMPLETERS

Student Category	1977–78		Status as of Early 1979–[1]				
					Available for Placement		Unemployment Rate[4]
	Population	Sample	Unknown	Not Available for Placement [2]	Employed [3]	Unemployed	
Minority Completers	2,110	1,070 (100%)	111 (10.4%)	319 (29.8%)	583 (54.5%)	57 (5.3%)	8.9% [5]
All Completers	12,490	7,133 (100%)	697 (9.8%)	2,225 (31.2%)	4,001 (56.1%)	209 (2.9%)	5.0% [5]

NOTES.

1/ Based on statewide follow-up survey conducted during the period January 1 – February 15, 1979

2/ Includes persons enrolled in school and other.

3/ Includes persons employed in training-related jobs as well as those employed in jobs not related to the field of their vocational training.

4/ The unemployment rate (UR) is calculated by dividing the number reported as unemployed (U) by the sum of employed (E) plus the unemployed ($UR = \frac{U}{E+U}$). This is the method used by the U.S. Bureau of Labor Statistics (BLS) to calculate unemployment rates.

5 Confidence intervals were calculated indicating a 95% probability that actual unemployment rates were between 6.7% and 11.1% for minority completers and between 4.3% and 5.6% for all completers. The formula used was $p \pm z_{.025}\sqrt{\frac{p\ (1-p)}{n-1}}$

SOURCE State A vocational education agency, management information system.

TABLE 6

UNEMPLOYMENT RATES IN EARLY 1979, STATE-B HIGH SCHOOL VOCATIONAL COMPLETERS: BLACK, WHITE, AND ALL COMPLETERS

Student Category	Number of Completers in 1977-78	Status as of Early 1979 [1]				
		Unknown	Not Available for Placement [2]	Available for Placement		Unemployment Rate [4]
				Employed [3]	Unemployed	
Black Completers	8,283 (100%)	790 (9.5%)	3,884 (46.9)	3,256 (39 3)	353 (4.3%)	9.8% [5]
White Completers	18,188 (100%)	1,333 (7.3%)	5,059 (27.8%)	11,420 (62.8%)	376 (2.1%)	3.2% [5]
All Completers	26,480 (100%)	2,126 (8.0%)	8,948 (33.8%)	14,677 (55.4%)	729 (2.8%)	4.7% [5]

NOTES

1/ Based on statewide follow-up survey conducted during the period February 1 - March 15, 1979.

2/ Includes persons enrolled in school and other.

3/ Includes persons employed in training related jobs as well as those employed in jobs not related to the field of their vocational training.

4 The unemployment rate (UR) is calculated by dividing the number reported as unemployed (U) by the sum of employed (E) plus the unemployed; $UR = \frac{U}{E+U}$ This is the method that the U.S. Bureau of Labor Statistics (BLS) uses to calculate unemployment rates.

5/ Confidence intervals were calculated indicating that there is a 95% probability that the actual unemployment rates were between 8.8% and 10 8% for black completers, between 2.9% and 3.5% for white completers, and between 4.4% and 5.1% for all completers. The formula used was $p \pm z_{.025}\sqrt{\frac{p(1-p)}{n-1}}$

SOURCE State B vocational education agency, management information system.

It must be emphasized that the main purpose of this section is to illustrate how certain evaluation procedures can be applied to a particular outcome and to highlight some problems encountered, not to report in depth on empirical evaluation studies per se. No attempt was made to design identical studies for the two states. Nor is there the opportunity to provide detailed information on how the two states differ in terms of their vocational programs, data systems, or the specifications and procedures used in conducting this particular outcome study. Most of the following discussion focuses on State-A, where the pilot testing first occurred and where more staff time was allocated to the study.

As indicated in Table 3 above, fourteen essential elements of information are identified for an evaluation study. How this checklist of elements can be applied to the risk-of-unemployment outcome is illustrated in general terms in Table 4, Outcome No. 3. For the specific case of State-A, details are given here only for those checklist items where the general information is inadequate.

In State-A, the "affected entity" consisted of vocational completers identified in school reports as American Indian, Black (not of Hispanic origin), Oriental, or Hispanic ("Latin-American, Spanish Surnamed American, or Mexican-American"—sometimes termed "Chicano"). In 1977-78, Hispanics accounted for about 70% of minority completers, while minority students in turn accounted for 16.9% of all completers.

The program or "treatment" identified as the strategic independent variable was completion during 1977-78 of a high school vocational program approved under the state's vocational education act. A basic requirement for approval, entailing financial support from the state, is that the program "be designed to provide students with an entry level occupational skill." Excluded from the list of state-approved programs is the area of consumer homemaking.

As the entries for Outcome No. 3 in Table 4 indicate (see checklist items 7 and 8), the suggested evaluation design calls for comparing the calculated unemployment rate for minority vocational completers with one or more similar groups of labor force participants. In the context of the State-A evaluation study, the most relevant characteristics for achieving similarity of groups included age, race/ethnicity, and level of schooling (i.e., high school graduates versus workers with less than a high school diploma). Two other variables, labor market area and sex, were acknowledged to influence unemployment rates but assumed to be partially "controlled for" so long as comparison groups were limited to the State-A labor force. Data requirements (checklist item 9) therefore included labor force statistics not only for the designated student population but also for one or more comparison groups.

Ideally, what was required was an unemployment rate for State-A minority workers, age 19, most of all of whom were high school graduates but had not taken vocational education. (The distribution of vocational completers by "high school graduate" versus "dropout" was not known in State-A, but state staff assumed that about 85% of all completers were high school graduates.) Furthermore, the data on labor force status should reflect the same time period (the vocational follow-up survey period was January-February, 1979) and the same definitions and survey methods.

To no one's surprise, ideal comparison data did not exist. In collaboration with the State Employment Security Agency (SESA), we were able to generate estimated statewide unemployment rates (URs) for

- all workers (UR = 3.2% as of February 1979; the rate was 3.7% for 1978 annual average)

(b) all minority workers (UR_b = 6.1% as of 1978, annual average; data not available for early 1979)

(c) all youth, age 16-24 (UR_c = 11.8% as of 1977, annual average; data not available for 1978 or early 1979)

(d) all minority youth, age 16-24 (UR_d = "16.4%" in 1976 and 1977, annual average; data not available for 1978 or early 1979; quotation marks indicate data are not of publishable quality).

We also had, from our own analysis of state vocational education data, an estimated unemployment rate for all vocational completers as of the time period covered by the survey:

(e) all 1977-78 vocational completers (UR_e = 5.0%).

And by manipulating national data published by the U.S. Bureau of Labor Statistics (BLS) in a variety of different reports, the staff was able to generate estimated unemployment rates as of various recent time periods for

(i) black youth (16-24)

(ii) Hispanic youth (16-24)

(iii) all youth (16-24)

(iv) the teenage (16-19) subsets of black, Hispanic, and all youth

(v) the 18 and 19-year-old subsets of black youth and all youth

(vi) high school graduates versus workers with less than a high school diploma (for two different age categories)

Then, in late 1979, BLS published Special Labor Force Report 223 summarizing results of a special survey of the high school class of 1978. Based on supplementary questions in the October 1978 Current Population Survey conducted by the U.S. Bureau of Census, this study reported the following estimated unemployment rates for the national sample of 1978 high school graduates who were not enrolled in college

- All — UR_x 14.1%
- Men — UR_x 11.1%
- Women — UR_x 17.1%
- White (both sexes) — UR_x 10.5%
- Black (both sexes) — UR_x 39.7%
- Hispanic (both sexes) — UR_x 15.9%

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The virtue of the BLS estimates is that they refer to the same high school cohort as the state data on vocational completers, thereby controlling for age and (approximately) for educational attainment. Use will be made of these data below.

It should be noted that national data consistently show unemployment rates for Hispanic youth to be higher than rates for all youth but substantially below the rates for black youth. The importance of UR differentials between blacks and Hispanics (there are also differences for American Indians and Asians) arises from the fact that the "minority" population of one state may be composed of quite a different racial/ethnic mix than the minority population of another state of the nation as a whole. In the case of State-A, blacks account for less than 20% of the minority population, whereas they account for 99% of the minority population in State-B. Nationally, blacks constitute 92% of the labor force category designated "Black and other," which is frequently used to represent the "minority" workforce. One must be careful, therefore, in making inter-state comparisons and in using national unemployment data for comparisons with state data (and even more so in the case of local data).

What we are addressing here is one of the most difficult, yet significant issues in program evaluation. The decision that is made will determine the entry for checklist Item II, "Findings (results of data analysis, warranted inferences, generalizability). Part of the findings were reported at the beginning of this section: unemployment rates of 8.9% and 9.8% calculated for minority vocational completers in two states. But what answer can be given to the question posed at the outset: Does completion of a high school vocational program reduce the risk of unemployment for minority youth? What inferences are warranted from the data on vocational completers and the comparison group? Is State-A's 8.9% unemployment rate for minority completers in early 1979 a good outcome, a bad one, or somewhere in-between?

Various unemployment rates for State-A were listed above (a,b,c,d,e) for possible use in making comparisons between vocational and nonvocational students. The 8.9% rate for minority completers (UR_m) clearly is much higher than the 3.2% rate for the overall State-A work force (UR_a). The latter, however, reflects the labor force status of prime-age workers (whose jobless rate is consistently much lower than the youth unemployment rate) and non-minority workers (whose UR, again, is below that for minorities). Comparing UR_m with UR_a is therefore not very meaningful.

The 8.9% January-February 1979 unemployment rate for minority completers is higher than the rate for all minority workers in the state (UR_b = 6.1%, 1978 annual average) but again the 6.1% rate measures the labor force status of prime-age minority workers as well as youth, so this comparison too is of limited value.

Percent not shown by BLS where base is less than 75,000, calculated from BLS data with a base of 63,000. Data on all 1978 high school graduates (not enrolled in college plus those enrolled in college) showed unemployment rates of 10.3% for whites, 40.1% for blacks, and 16.2% for Hispanics. Source: BLS, 1979, Table 3. The Special Report was reprinted, with supplementary tables, from the October 1979 issue of the *Monthly Labor Review*.

The 8.9% rate is also lower than the jobless rate for all youth (UR_c = 11.8%, 1977 annual average) and even more so for minority youth (UR_d = "16.4%," 1976 annual average). The time periods to which the rates refer, however, differ significantly. Indeed State-A's overall unemployment rate in 1976 (UR = 6.4%) was exactly *double* the February 1979 figure. Moreover, UR_c and UR_d measure the labor force status of high school dropouts and teenagers still enrolled in high school (groups tending to have the highest of all jobless rates) as well as high school graduates. Comparing UR_m with UR_c and UR_d is therefore not really appropriate.

One of the possibilities that remains is to compare data in State-A with national data. Two major factors argue against making direct comparisons. First, State-A's unemployment rate in early 1979 was only half the national figure, and in fact was at or below the frictional unemployment level that economists use to define full unemployment.[2] At this low level, the UR loses much of its capacity to measure involuntary unemployment. Secondly, there are no national figures on "minority" unemployment. To use national data would require calculation of a weighted average on the basis of the mix of black, Hispanic, and other minority groups, or simply the use of the unemployment rate for Hispanics as a proxy for the entire minority population. Considering that the category Hispanic includes workers of Puerto Rican, Cuban, Mexican, Spanish, and other origin this procedure does not appear appropriate for a state that may have few if any workers from some of the groups indicated.

Another possibility is to compare the 8.9% unemployment rate for minority completers with the 5.0% rate for all completers (UR_e). This comparison "controls" for time (common survey period), age, and educational attainment (as well as the variables of sex and labor market area, to some extent). What is not controlled is race/ethnicity.

The ratio of the unemployment rate for minority completers to the unemployment rate for all completers to the unemployment rate for all completers (8.9%/5.0%—which we term the unemployment disparity index (UDI)[1]—is 1.8. This figure indicates that completing a high school vocational program does not bring the risk of unemployment for minority youth down to parity with non-minority youth. (Such a situation would yield a UDI of 1.0.) Few would predict that result. To the extent that racial/ethnic discrimination and related differences exist in labor

Frictional unemployment is caused by workers being "between jobs" or, as in the case of young people or displaced homemakers, looking for their first jobs. Workers may be frictionally unemployed because of bad weather, model changeovers, or other temporary interruptions in production. For the economy as a whole the level of frictional unemployment is thought to be in the range from three to five percent. Because of initial job-search problems and greater mobility, youth probably have a higher level of frictional unemployment than the prime-age labor force. See McConnell (1978).

[1] The employment disparity index (UDI) is defined as the ratio of the unemployment rate (UR) of one labor force subset (M) to the rate for the entire labor force (Σ) or, alternatively, to the complement (J) of the first subset (i.e., $J = \Sigma - M$). Thus, $UDI = \frac{UR_M}{UR_\Sigma}$ or $UDI = \frac{UR_M}{UR_J}$,

whichever formulation is indicated by available data and analytical context.

markets, one would hardly expect that a few hundred hours of high school training could completely offset market inequities. But one might ponder whether completion of an approved high school vocational program would *reduce* the disparity in the risk of unemployment. Suppose the unemployment rate for all minority youth in the state is 20% (i.e., one minority youth in every five can expect to be jobless) while the figure for *all* youth is 10% (i.e., UDI = 20%/10% = 2.0). If the comparable rates for minority vocational completers—most of whom are also high school graduates—and all vocational completers were, say 12% and 8% (i.e., UDI = 12%/8% = 1.5) then it could be inferred that vocational education may have reduced the relative risk of unemployment for minority youth.

In the absence of directly comparable unemployment data (i.e., to show the influence of completing a vocational program on the risk of unemployment as opposed to the effects of age and high school graduation), UDIs were calculated and applied to the 1979 follow-up data. Results showed lower UDIs for all workers (minority UR of 6.1% in 1978 ÷ total UR of 3.7% in 1978; UDI = 1.6) and for all youth (minority UR of 16.4% in 1977 ÷ total UR of 11.8% in 1977; UDI = 1.4) than for minority vocational completers compared with all vocational completers. Thus, while the combination of characteristics A (completion of a vocational program) + B (graduation from high school) + C (becoming 19 years of age) taken altogether may or may not reduce the absolute risk of unemployment for minority youth in State-A, there is no evidence that factor A alone lowers the relative risk of unemployment for this group in the short run. In the concluding section of this chapter, additional observations will be made about the unemployment disparity index and possibilities for further development and use of the disparity index concept.

Turning to State-B, less comparison data was found there than in State-A. As reported in Table 6 above, the unemployment rate calculated for minority (i.e., black) completers was 9.8%. The UR for all completers was 4.7%, and for white completers it was 3.2%. The latter yielded an unemployment disparity index of 3.1, which compares with a UDI of 2.6 for all black workers in the state versus all white workers (1978 annual average). Since there were no recent state data for minority youth, it was not possible to calculate directly a UDI for the youth subset of State-B's labor force.

Use of national data, however, appears to be much more appropriate for making comparisons in State-B than State-A, chiefly because of the larger size and greater homogeneity of State-B's minority population. The BLS estimates for black 1978 high school graduates not enrolled in college (national sample) indicated an unemployment rate of 39.7%. In 1977 and 1978 State-B's estimated unemployment rates for teenage black youths and for black workers of all ages (the only two age categories of black workers available)—including high school dropouts, enrolled students, and graduates—were about the same as national rates. This suggests that national data can be used as a proxy for State-B data. State-B's UR of 9.8% for vocational completers from the same high school cohort was less than one-fourth the national rate, suggesting a reduction of more than 75% in the absolute risk of unemployment for State-B's minority youth. It is not clear how much of this risk-reduction can be attributed to completing a vocational program and how much might be associated with other factors that make up the State-B education and employment picture.

Regarding the relative risk of unemployment, the BLS national data indicated a UDI of 3.8 for black high school graduates as compared with white graduates. Since the UDI for black versus white vocational completers in State-B was 3.1, the data indicate a reduction of 18% in the relative risk of unemployment for black youth. It seems warranted to infer, therefore, that the risk of unemployment for minority (i.e., black) youth in State-B is substantially reduced by completing a high school vocational program. See Table 7 for summary data on both states.

Table 7

MEASURES OF UNEMPLOYMENT DISPARITY AMONG HIGH SCHOOL VOCATIONAL COMPLETERS AND OTHER GROUPS OF WORKERS: SUMMARY TABLE

State	Group	Data Source and Time Period	Unemployment Rates	Unemployment Disparity Indexes [1]
A	Minority Completers vs All Completers	State Vocational Follow-up as of Early 1979	8.9% vs 5.7%	$UDI_1 = 1.8$
A	Minority Workers vs All Workers	State Employment Security Agency, 1978 Annual Averages	6.1% vs 3.7%	$UDI_1 = 1.6$
A	Minority Youth vs All Youth	SESA, 1977 Annual Averages	16.4% vs 11.8%	$UDI_1 = 1.4$
B	Black Completers vs White Completers	State Vocational Follow-up Survey as of Early 1979	9.8% vs 3.2%	$UDI_2 = 3.1$
B	Black Graduates of 1978 High School Class vs White Graduates	U.S. Bureau of Labor Statistics as of October, 1978	39.7% vs 10.5%	$UDI_2 = 3.8$

[1] See text for a definition of the unemployment disparity index and for alternative formulations.

SOURCE Table 5, Table 6, text, and footnotes.

Not to be overlooked in a discussion of findings are the data on high school vocational completers as a whole, i.e., minority plus non-minority. For all completers in State-A, the unemployment rate in early 1979 was 5.0%, and in State-B the unemployment rate was 4.7% (see Tables 5 and 6 above). These figures approximate frictional levels of unemployment, indicating a zero level of involuntary unemployment. Depending on the frame of reference, these findings could be regarded as more significant than the findings reported for minority students. Evaluation findings depend on what questions are asked and what evaluation standards are applied as well as on the data. Again, however, since the outcome selected for analysis here was defined in terms of minority students, no further discussion will be presented on the broader category of all completers.

The impact of these findings (checklist Item I2) and the manner and extent to which they are disseminated (Item I3) will largely be determined by officials of the two states. As previously stated, the National Center's primary concern in this R&D study is the identification of outcome criteria and development of operational procedures rather than carrying out and reporting in-depth empirical evaluation studies per se.

With respect to the particular outcome used in the pilot tests, several implications for further research, development, and evaluation (RD&E) activities can be noted (checklist Item I4). First, some of the findings, especially in State-B, appear to differ from earlier studies. Methods and results should be carefully compared. Second, steps have already been taken to replicate the study of this outcome in a third state, with certain modifications reflecting local interests and concerns.

In State-A the question was raised as to whether the evaluation standard should require a *lower* unemployment rate for minority vocational students than for minority nonvocational (i.e., college preparatory and general) students of the same age and educational attainment. If vocational students tend to have socioeconomic and demographic characteristics that place them at a disadvantage with nonvocational students in the competition for jobs (controlling for race/ethnicity), then it should suffice as a demonstration of vocational education's effectiveness to overcome the initial disadvantage (partially or completely) without requiring that vocational students out-perform nonvocational students. Data on the characterisitics of vocational versus nonvocational students, however, did not exist. Consequently as a byproduct of the pilot testing, an internal study was undertaken to compare verbal and quantitative abilities of a sample of vocational and nonvocational students. Interest was also expressed in a follow-up study of the completers who were reported to be unemployed at the time of the survey in order to learn why they were jobless because they were not offered employment; because they were holding out for a job related to their occupational training; or for other reasons.

One final implication for further RD&E activities. If resources and time were available, it might be possible to develop better comparison-group data than presently exists within the two states. Special follow-up surveys of nonvocational students in the same high school cohort as the vocational completers could be conducted, thereby controlling for labor market conditions as well as age and educational attainment.

C. Limitations of the Pilot Tests

Despite limitations in the pilot testing, some important lessons have been learned about data availability, policy and program differences among SEAs and LEAs, complexities and unanswerables related to evaluation standards, and the practical usefulness of the overall

procedures employed. A great deal more could be learned if SEA, LEA, and independent evaluators were to conduct outcome studies using procedures similar to those described in this report subsequently sharing their findings and procedures with other interested evaluators. Program evaluation, however, is a painstaking, time-consuming, and costly activity when carefully done. The "quick-and-dirty" approach may save time and money but is unlikely to yield credible results that can serve as a basis for informed decision making or add to the general body of documented knowledge concerning the outcomes of vocational education.

In the preceding section, reference was made to the concept of the unemployment disparity index which was developed as one possible approach to providing quantitative evaluation standards. The use of ratios, particularly if they are reasonably constant over time, can help the evaluator make meaningful comparisons even when data are not available for a particular time period or population. The basic concept underlying the unemployment disparity index has many potential applications. As is true with any statistical tool, it is also subject to limitations and vulnerable to misuse. Further developmental work should be done with disparity indexes before the technique can be unreservedly recommended for general use.

Another important limitation of the pilot studies concerned the definition of the strategic independent variable (checklist Item 4 in Tables 3 and 4). The project staff suspects that significant differentials would be found to exist in unemployment rates according to the particular occupational programs (e.g., Distributive Education, Trade and Industrial, Business and Office) that various minority students completed. In this study, all programs were lumped together under the rubric of vocational education.

Finally, it may bear repeating that the entire study was limited to the topic of outcomes. No attempt was made to evaluate vocational education on the basis of other types of criteria (see Chapter I). Nor were cost factors or monetary benefits addressed in the study. The focus was on program effects, not program efficiency.

V. SUMMARY OF FINDINGS AND RECOMMENDATIONS

This chapter presents a summary of findings from the National Center's two-year study of outcomes and concludes with recommendations for utilizing the products of this study in making policy decisions and carrying out further research, development, and evaluation (RD&E) activities.

A. Some Lessons Learned from the Study

Phase One of the outcome study, initiated in 1978, was essentially exploratory. The project staff took stock of where vocational education was and where it had been with respect to outcomes evaluation. An examination of evaluation literature disclosed conceptual ambiguities, data gaps, and methodological shortcomings. Published and unpublished reports questioned whether vocational programs had actually improved occupational skills, employment success, or wage rates. One writer complained that "analysts have not even agreed on . . . (vocational education) outcomes to be tested" (Reubens, 1974, p 24). The staff concluded that research and evaluation had not yet produced a substantial body of documented knowledge regarding the outcomes of vocational education.

Some additional lessons learned by the project staff during early stages of the inquiry and confirmed in the second year were the following:

- Members of the vocational education community, including researchers and evaluators, tend to use the terms outcomes, outcome measures, program goals, and program benefits interchangeably. This practice interferes with clarity of communications and clarity of inquiry.

- In many reports and discussions it is not made clear what is being evaluated—an outcome, a group of students, a vocational education program, or something else. In particular, there seems to be persistent confusion about the role that outcomes play as evaluation criteria.

- Views held by many members of the vocational education community, policy analysts, and others disclose a lack of appreciation of the broad range, diversity, and complexity of possible outcomes "Placement" in a job that is related to a former student's area of occupational training is sometimes viewed as the sole worthwhile consequence of vocational education, even at the high school level (although this position in by no means universally accepted by members of the vocational education and RD&E communities). Evaluation standards typically are not clearly identified, and in fact are often completely ignored in what purport to be evaluation studies. Yet if there is no standard to which program outcomes can be compared, there is no basis for formulating judgments concerning the merit of the program, i.e., there is no real evaluation.

- There seemed to be no clear conceptual base for program evaluation, no consensus on procedures, and little agreement on research techniques and statistical methods to be employed. The relative importance of outcomes compared with other types of evaluation criteria has not been well addressed.

- Many evaluation studies have strong overtones of advocacy. They seem to be motivated less by a desire to evaluate programs on the basis of empirical evidence and cogent evaluation standards than by a zealous determination to either document program benefits or to "prove" that vocational education does not generate benefits.

These perceptions influenced the staff in setting and adjusting priorities for its work throughout the two years of the inquiry.

Responding to some challenges implied by the state of affairs described above, the National Center staff has developed

(1) A compendium of 252 vocational education outcome questions (Year 1)

(2) A selected list of fifteen key outcomes for possible use, among other criteria, in evaluating vocational programs (Year 2)

(3) A conceptual framework for outcomes evaluation and clarification of outcome evaluation concepts (Years 1 and 2)

(4) A general set of pilot-tested operational procedures for evaluating vocational programs on the basis of outcomes; findings and limitations of the pilot tests are presented in Chapter IV (Year 2)

(5) Procedural notes for operationalizing each of the fifteen selected outcomes according to a consistent format (Year 2).

B. Recommendations

The following recommendations for applying the lessons and products of this study are addressed primarily to vocational education evaluators, supervisors of evaluation, state and local vocational directors, and sponsors of evaluation studies. The recommendations may also be of interest to policy analysts, university instructors and researchers, and to people who advise and make decisions on vocational education policy.

(1) In planning evaluation studies, care should be taken to determine clearly what is to be evaluated and what criteria, data, and evaluation standards are to be used. There are numerous potential candidates to serve as the object of an evaluation (including broadly defined or more narrowly limited vocational programs), many and diverse criteria, and a variety of data types and evaluation standards. Establishing agreement on criteria and standards may not be an easy task. The fourteen-point checklist of essential elements of information is no magic formula; but its use is recommended for designing and carrying out evaluation studies where clarity, completeness, and consistency are desired

(2) It should be openly acknowledged that no national consensus exists on a limited set of outcomes to serve as evaluation criteria. There are disagreements concerning the appropriateness, importance, and feasibility of various outcomes. Outcome criteria that are appropriate for State X in Year Y may not be at all suitable for City R in Year Z. Sponsors of evaluation studies should provide for the selection of criteria and a corresponding rationale to justify the selection in the particular context of the study.

(3) It should also be recognized that no single outcome criterion is likely to be satisfactory by itself for evaluating a vocational program. Educational programs generate multidimensional outcomes. What is viewed one year as a principal product of vocational education may in two or three years be relegated to secondary importance, with last year's "byproduct" emerging as a new favorite accountability criterion. Evaluation sponsors are advised to avoid putting all of vocational education's evaluation eggs in one small, rigid basket.

(4) The concept of the unemployment disparity index (UDI) introduced in Chapter IV, and similar techniques for operationalizing evaluation standards, should be further developed and carefully critiqued.

(5) Implementation of the RD&E agenda proposed in an earlier report (Darcy, 1979a) should be vigorously pursued by vocational education organizations including the National Center, U.S. Department of Education, National Advisory Council on Vocational Education, and state and local education agencies. Sustained efforts are needed over the next three to five years to

- resolve definitional problems
- clarify the mission and objectives of secondary, postsecondary, and adult vocational education
- define data needs and collect key data
- expand awareness of the diversity and range of possible outcome criteria
- provide specific evaluation standards
- accumulate a documented body of empirical knowledge concerning outcomes, and
- assure that evaluation findings are (a) clearly communicated to relevant audiences (including policy makers, practitioners, and other evaluators) and (b) applied in the interest of improved educational effectiveness and efficiency.

(6) Finally, efforts to expand our knowledge of the actual outcomes of vocational education should be directed not only to labor market consequences but also to outcomes of a nonmarket nature.

Effective dissemination and application of procedures described in this report could have a positive impact on vocational education evaluation in the 1980s. It has also been suggested that the ideas and information presented here may have a broader influence—by changing the way people think about other facets of vocational education. Increased awareness of outcome evaluation issues could stimulate a systematic reexamination of educational goals, needs and procedures for program design and management, staff development, and policy making at community, state, and national levels

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