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**ABSTRACT**

This document consists of three separate monographs on vocational education research. The first, "Using the Nominal Group Technique To Determine Priorities for Vocational Education Research," (Richard L. Lynch, and others) describes a conference of 23 key thinkers representing business and industry, public policy, and educational research. The Nominal Group Technique was used to develop consensus on broad categories that should have implications for future vocational education research. These categories are competencies, content, and instructional methods; equity and access; vocational education data; policy; communications, marketing, and public relations; and delivery systems and levels. In the study described in "Future Research Priorities as Identified by Major Providers of Vocational Education Research," (B. June Schmidt, and others) 49 providers of research and development (R&D) were identified; 63 percent completed questionnaires from which were compiled organizational mission statements, existing R&D, important findings and conclusions, and priorities for future research. Tables and appendices provide (1) the mission statements; (2) 122 priority areas categorized in six groups (program development and improvement, policy studies, effectiveness, basic skills development, collaborative relationships, and personnel development); and (3) status of existing R&D projects. The third paper, "A Summary of Trends and Issues with Implications for Research and Development in Vocational Education," (by faculty of Virginia Polytechnic Inst.), reviews societal characteristics and trends, economic trends, and technological change and lists implications and recommendations for vocational education research. (SK)

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PRIORITIES FOR RESEARCH AND DEVELOPMENT  
IN VOCATIONAL EDUCATION

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Monographs Prepared in Partial Fulfillment of  
a Planning Grant for a

National Center for Research  
in Vocational Education

Richard L. Lynch, Project Director

August, 1987

CE 049399

MONOGRAPHS

PRIORITIES FOR RESEARCH AND DEVELOPMENT IN VOCATIONAL  
EDUCATION:

1. USING THE NOMINAL GROUP TECHNIQUE TO DETERMINE  
PRIORITIES FOR VOCATIONAL EDUCATION RESEARCH

Richard L. Lynch  
F. Marion Asche  
Susan B. Asselin  
Penny L. Burge  
Curtis R. Finch  
Nevin R. Frantz  
Shirley L. Hall  
Margaret W. Kirby  
John A. McLaughlin  
J. Dale Oliver  
B. June Schmidt

2. FUTURE RESEARCH PRIORITIES AS IDENTIFIED BY MAJOR  
PROVIDERS OF VOCATIONAL EDUCATION RESEARCH

B. June Schmidt  
Richard L. Lynch  
Nevin R. Frantz, Jr.  
Shirley L. Hall

3. A SUMMARY OF TRENDS AND ISSUES WITH IMPLICATIONS FOR  
RESEARCH AND DEVELOPMENT IN VOCATIONAL EDUCATION

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USING THE NOMINAL GROUP TECHNIQUE  
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August, 1987

## Foreword

The purpose of the Nominal Group Technique conference detailed in this report was to determine future research priorities for vocational education research and development and for vocational personnel development. The 23 conference participants were some of our nation's leading thinkers and problem solvers. Their input provides new directions for vocational education research.

The conference was held as part of the planning grant for a National Center for Research in Vocational Education awarded to the Division of Vocational and Technical Education, Virginia Polytechnic Institute and State University, by the United States Department of Education. Preparations for the conference were completed by Dr. Richard L. Lynch, project director; Dr. Nevin R. Frantz, project co-director; and Shirley L. Hall, assistant to the project directors. In addition, a number of the VTE faculty members contributed to the success of the conference. They include Dr. Marion Asche, Dr. Susan Asselin, Dr. Penny Burge, Dr. Curtis Finch, Dr. Margaret Kirby, Dr. J. Dale Oliver, and Dr. B. June Schmidt, who served as session facilitators. In addition, Drs. Asche, Finch, Kirby, Oliver, and Schmidt assisted Dr. Lynch with the preparation of this report. Dr. John McLaughlin, Director of Research Development for the College of Education, acted as the special consultant for the Nominal Group Technique procedures.

Note: The contents of this report were developed under a grant from the U. S. Department of Education. However, the contents do not necessarily represent the policy of the Department of Education, and it should not be assumed that they are endorsed by the Federal Government.

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## Introduction

One source for determining research priorities for vocational education is through input from key thinkers and futurists who have an interest in vocational education. These individuals come from business and industry, from public organizations and institutes, and from the educational community. Compiling their ideas into usable priority statements for vocational education research can beneficially direct the future of such research.

In recent years, vocational educators have demonstrated concern about establishing directions for vocational education research. A major effort aimed at this purpose was the Colloquium on Vocational Education Research in the 1980s sponsored by the Coordinating Committee on Research in Vocational Education and by the American Vocational Education Research Association (David, Hjelm, & Harris, 1983). The colloquium met in 1982. Since then, numerous changes have impacted society, the work place, and our schools, including vocational education offerings within them. A National Center for Research in Vocational Education authorized through Section 404 of the Carl D. Perkins Vocational Education Act (20 U.S.C. 2404), with redirected and expanded research objectives, is to begin a new five-year funding cycle beginning in January of 1988. Hence the time to examine research priorities for vocational education once again is at hand.

One limitation of the 1982 colloquium for identifying vocational education research priorities was that 11 of the participants were individuals already heavily involved in vocational education research. To reflect society at large in setting such priorities, input from

individuals outside of vocational education is essential. Thus, as part of a planning grant for developing a proposal for a National Center for Research in Vocational Education (National Center), input was sought from key thinkers and futurists outside vocational education as well as key thinkers and futurists from within vocational education.

The processes used through the planning grant to determine specific research and development priorities for the National Center that would fulfill its mission were those identified with qualitative research methodologies. Qualitative data, in the form of words rather than numbers, have always been the staple of certain social sciences, notably anthropology and political science. In the past decade, however, more researchers in fields with a tradition in quantitative analysis (e.g., business, education, public administration, policy analysis) have shifted to a more qualitative paradigm (Miles & Huberman, 1984). Conclusions produced from qualitative data ". . . are most likely to lead to serendipitous findings and to new theoretical integrations; they help researchers and planners go beyond initial preconceptions and frameworks" (p. 15).

A specification of the planning grant for the National Center awarded to Virginia Polytechnic Institute and State University was that a conference of "key thinkers" from business and industry, from public policymaking organizations and institutions, and from the educational



research community would be held. The Nominal Group Technique (Delbecq, Van de Ven, & Gustafsen, 1975), which encourages input from all group members, was used with the 23 participants at the conference as a process for obtaining qualitative data from them. The outcomes of the conference were priority statements for vocational education research and for research related to vocational personnel development.

The Nominal Group Technique (NGT) is designed to collect information systematically from two or more persons engaged in problem solving, in identifying needs, or in establishing goals and priorities for action. Different approaches exist for obtaining data or ideas in a group setting. One, the typical way, is the interactive method, in which participants say what they wish to say when they wish to say it; another way is through use of the NGT. One problem with the interactive method is that many persons who have good ideas tend to sit back and not provide input. Other problems are that one or two individuals may dominate the group and the "positions" (status) of some participants in the group may hinder others from participating. Interactive method groups tend to produce a smaller number of different kinds of solutions than groups using the NGT procedures.

This report describes procedures for using the NGT and details how it was used to establish priorities for research in vocational education. The findings and discussion from the NGT conference and conclusions emanating from the data are presented.

#### Procedures

The primary purpose of the one-day NGT conference held May 12, 1987, was to gather input from some of America's leading thinkers and problem

solvers to stimulate new directions for vocational education research and development areas for the next five years.

#### Selection and Preparation of Participants

Chief executive officers (CEOs); presidents; directors; public spokespersons; educational liaisons of businesses and industries, public agencies, research institutes, and educational organizations; and university researchers recognized for their success and effectiveness were contacted. The company/agency head or spokesperson was asked to nominate a person from that organization who (a) is well recognized for creative, futuristic thinking; (b) has been involved in planning activities designed to chart the future course of a company, agency, or policy; and (c) could donate some time (one or two days) for purposes of planning national research and development activities in vocational education. The 23 individuals so identified who participated in the NGT sessions on May 12, 1987, are listed in Appendix A.

Prior to participation in the NGT conference, each participant received a telephone call, a letter, and a 16-page report synthesizing the settings and issues in vocational education; succinctly analyzing important research relative to vocational education; and highlighting key cultural, sociological, economic, and demographic trends impacting on vocational education. The report, prepared by the faculty and staff in the Division of Vocational and Technical Education at Virginia Polytechnic Institute and State University, was titled "A Summary of Trends and Issues with Implications for Research and Development in Vocational Education."

### The Nominal Group Technique

Research procedures identified with the Nominal Group Technique (NGT) were followed in the conduct of the conference. The NGT is a systematic data collection method that combines the synergy provided by a group with a technique that minimizes the possibility of dysfunctional group behavior (Ludden & Wood, 1987). The NGT was initially developed as a method of problem solving (Ulshak, 1983) with procedures established allowing "... individual judgments to be effectively pooled and used in situations in which uncertainty or disagreement exist about the nature of the problem and possible solutions" (Moore, 1978, p. 24). The NGT, however, has also been adapted by individuals, for example, in the training field for needs assessment (Gepson, Martinko & Belina, 1981; Scott & Deadrick, 1982), in higher education for curriculum development (O'Neil & Jackson, 1983), and in setting research priorities in adult education (Ludden & Wood, 1987).

The NGT has been empirically tested with a variety of groups and in a variety of situations and found to be "promising" (Kaiser & Woodman, 1985, p. 465); "more effective than the conventional discussion group process" (Van de Ven & Delbecq, 1974, p. 620); effective in producing "significantly more implementation than did less formal interactive processes" (White, Dittrich, & Lang, 1980, p. 428); and "a highly effective mechanism for providing informational input" (Stephenson, Michaelson, & Franklin, 1982, p. 320). Drawing on prior research, O'Neil and Jackson (1983) summed up the benefits of the NGT as follows:

a. Task-instrumental advantages:

- (1) The tendency of interacting groups to focus on single themes for lengthy periods is circumvented.

- (2) Hidden agendas are made public early in the group's life.
- (3) Convergence on a decision, without available information, is postponed.
- (4) The volume of ideas generated in a given time is greater.
- (5) Hitch-hiking on the ideas of others is encouraged.

b. Socio-emotional advantages

- (1) All participants are allowed an equal opportunity for contributing to the joint task: the influence of dominant (high status) members is minimized.
- (2) Group pressures for conformity are restricted.
- (3) Leadership struggles and other personality clashes are avoided.
- (4) Focus on task activities is higher in that group-maintenance factors are deemphasized: task avoidance behavior is low.
- (5) Group satisfaction with the process is higher (p. 132).

Objectives of the NGT

The NGT procedures enable facilitators to build a consensus in the group through processes involving group members working together. The goal of consensus group activities is to allow all participants to have control over the decisions that are made. The NGT has three main

objectives: (a) To guarantee that each person in the group will make a contribution to the final product of the group's activity, (b) To promote the benefits of "group thinking" without compromising the integrity of individual input (that is, to encourage the creativity of each individual by preventing the most outspoken individuals from dominating the group), and (c) To produce a product; i.e., a list of needs or problems ranked in order of importance within a given period of time.

NGT Facilitators. Groups of 7-9 persons are formed as part of the NGT process. Each group has two facilitators: one does the talking, but does not lead or have influence on what is said; the other is the recorder. The recorder writes on flip charts ideas exactly as stated by each participant. The only comments allowed of the recorder are in the "Did I get it right?" category.

To ensure success of the use of the NGT with the 23 participants, facilitators for the NGT sessions were trained. The training session, held May 1, was essentially a trial run of the NGT using the facilitators being trained as participants. The nominal question used from which to generate ideas was "What barriers do you anticipate in using the NGT?" Dr. John McLaughlin, who has had extensive experience in using the NGT with various groups, was the NGT trainer/consultant. Appendix B provides a list of individuals who were prepared as facilitators.

Steps of the NGT Process. Briefly summarized, the four steps of the NGT process are as follows:

1. Silent Generation of Ideas in Writing

Each participant is given a 3" x 5" card and asked

to list all the responses to the question he or she can think of in five minutes.

2. Round-Robin Recording of Ideas on Flip Chart

Going around the table, each participant is given an opportunity to state one of his or her ideas (responses to the question) to be listed on the flip chart. This is done until each participant "passes" (has no further ideas).

3. Serial Discussion for Clarification

Going around the table, the facilitator asks each participant if there are any ideas that need clarification. Participants may speak for or against any item at this time.

4. Vote on Idea Importance

Each participant lists on another 3" x 5' card his or her top five priority ideas from the list on the flip chart. The most important ideas for each person are assigned points in the following sequence:

Most important	= 5 points
Next most important	= 4 points
Third most important	= 3 points
Fourth most important	= 2 points
Least important	= 1 point

The facilitator proceeds around the table asking each person for the most important (5-point) idea, and the recorder marks the vote on a tally

sheet. The same procedures is followed for the 4-point, 3-point, 2-point, and 1-point ideas. A tally is then made for all ideas based on both frequency and importance. From the tally, the five top-ranked ideas are identified and they become a major product of the NGT session.

According to Moore (1987), ". . . the ideal size of an NGT group is 5 to 9 members" (p. 25). With groups of this size, the entire process can be completed in just over an hour. Moore indicates that there are three essentials to the NGT process: (a) a carefully prepared question that will evoke specific responses, (b) a group of task-oriented individuals with expertise in the topic of the question, and (c) a group leader who is willing to act as a process facilitator, not a substantive expert.

#### Structure of the NGT Conference

As noted previously, a one-day conference was held on May 12, 1987, in the Washington, D.C., area. The purpose of the conference was to provide input for vocational education research priorities. The conference was built around the use of the NGT procedures. Following is the conference agenda:

10:00 - 10:30	Orientation
10:30 - noon	NGT Question No. 1
12:00 - 12:15	Group Sharing (Top 5 priorities)
12:15 - 1:15	Lunch
1:15 - 2:45	NGT Question No. 2
2:45 - 3:00	Group Sharing (Top 5 priorities)

For the morning NGT sessions, three groups of 6-9 members each were formed. The groups were composed of individuals from business and industry, public policymakers, and university researchers, respectively. For the afternoon sessions the three groups each had 7 or 8 members, with membership composed of individuals from each of the morning groups (i.e., the afternoon groups consisted of individuals with mixed perspectives on vocational education).

All three of the morning groups responded to the following NGT question.

QUESTION: What should be the research and development priorities for vocational education for the next five years?

Likewise, the afternoon groups responded to the following NGT question:

QUESTION: What are the research and development needs related to vocational education professionals (e.g., teachers, administrators, state staff personnel)?

#### Analysis of the Data

All of the ideas were recorded on a flip chart by one of the group facilitators. After the conference, each of the ideas (responses to each of the nominal questions) was printed on a card. The project staff then subjectively identified broad topics or categories into which the ideas seemed logically to be classified. A card sort was then developed and a panel of six experts, consisting of faculty and doctoral students in the Division of Vocational and Technical Education, classified the responses to the two nominal group questions into the broad categories. Outcomes from this card sort procedures are presented in Tables 1 and 3.



At the conference, each participant was asked to identify his or her top 5 priority ideas from the total list. The most important ideas for each person were assigned points, 6 being the most important, 4 next, 3 next, 2 next, and 1 being least important of the 5 ranked ideas. The facilitators recorded the votes on a tally sheet. A tally was then made for all ideas, based on both frequency and importance. From the tally, the top five ranked ideas were identified for each group. Results of this procedure, which was followed for both nominal questions, as provided in tables 2 and 4.

#### Findings and Discussion

As shown in Table 1, the 23 participants generated 102 responses classified into seven categories to the question, "What should be the research and development priorities for vocational education for the next five years?" There were 35 responses generated from the business and industry group, 33 from the public policymaker group, and 34 from the university research groups.

The responses were categorized by a panel of experts into seven major categories: (a) "Competencies, Content, and Instructional Methods" (10 statements); (b) "Equity and Access" (12 statements); (c) "Vocational Education Data" (15 statements); (d) "Policy" (8 statements); (e) "Communications, Marketing, and Public Relations" (5 statements); (f) "Delivery Systems and Levels" (6 statements); and (g) "Miscellaneous" (46 statements). The "Miscellaneous" category contains those responses for which there was not at least 70% agreement among the members of the panel as to the category for the response.

Each item has been coded with an A, meaning the statement was generated by the business and industry group; a B, referring to a statement made by the public policymaker group; or a C, identifying a statement made by the university researcher group.

The largest number of responses were placed by the panel into the "miscellaneous" category. This was probably a result of the panel classifying responses into categories on the basis of the exact working provided by the respondents at the conference. Further content editing of the responses was not undertaken after the conference to avoid the possibility of making a substance error. Panel members, therefore, frequently were uncertain of the original meaning and elected to categorize many responses as "Miscellaneous."

With respect to responses classified in the other six categories, business and industry persons provided the relatively largest number of responses in two categories: (a) "Competencies, Content, and Instructional Methods" (6 out of 10) and (b) "Communications, Marketing, and Public Relations" (3 out of 5). University researcher; and policymakers combined to provide the vast majority of the responses in three categories; i.e., 9 of the 12 are in "Equity and Access," 11 of the 15 are in "Vocational Education Data," and 7 of the 8 are in "Policy." The three groups provided an equal number of responses in the "delivery Systems and Levels" category.

Table 2 lists the top five priority responses, 1 through 5, for Group A (Business and Industry), Group B (Public Policymakers) and Group C (University Researchers). These priorities for vocational education research were determined through the procedures outlined in the

Table 1

Research and Development Priorities for Vocational Education  
as Determined by Selected Groups

---

Category 1: Competencies, Content, and Instructional Methods

- A Competency standards for programs, students, and instructors<sup>a</sup>
  - A Defining nonoccupational work place and social skill requirements for the future
  - A How can vocational education contribute to improved teaching of basic skills and critical thinking?
  - A Investigate a taxonomy of human work performance and link to knowledge, skills, and abilities
  - A How can we build literacy motivation into vocational education?
  - A Clarification of and redefine basic skills
  - B What can be done to increase the diversity of instructional capacity?
  - C Determination of effective new instructional models
  - C Strategies for developing decision making thinking skills
  - C Modernize the occupational curriculums
-

Category 2: Equity and Access

- A Adequate access to vocational training in all school systems
- A How can vocational education improve services to at-risk populations; e.g. dropouts?
- A What can vocational education do to end sex segregated work roles/situations?
- B What are strategies and techniques for increasing effective integration of nontraditional vocational education students into vocational education?
- B Effects of prevocational/guidance on student retention in programs
- B Should vocational education be for children who have limited vocational potential?
- B Study of vocational assessment and other entry criteria to determine validity in regards to success in vocational education and employment
- C Research on at-risk youth (feminization of poverty, limited English proficiency, handicapped, disadvantaged)
- C Means for improving equity
- C Collaboration of vocational education to serve inner city and rural populations
- C Mainstreaming special needs students without impeding regular students

- C Effective models for developing and implementing individual plans for special needs learners
- 

Category 3: Vocational Education Data

- A Develop a national data base of vocational students for vocational training
- A Data base of types of job openings by regions
- A A better procedure to follow-up students who get jobs in relation to the curriculum
- A Longitudinal research on use of vocational education training in life careers
- B To project accurately job opportunities in various occupational areas
- B Implications of national ASVAB testing for military in secondary schools relating results to successful results in vocational programs
- B Estimate economic rates of return to society provided by an investment in vocational education
- B Effects of vocational education on students entering nonprogram related occupations
- B What can we learn through comparative studies (e.g., German apprenticeship programs)?
- B Function of time and change on the assimilation of occupational education

- C Creating an articulated research paradigm
  - C Research on improving academic skills of vocational students on standardized tests, especially PSAT
  - C National assessment of the effectiveness of vocational programs
  - C Establish national clearinghouse for vocational education: problems
  - C Compile data on all deliverers of education for employment
- 

#### Category 4: Policy

- A In local schools, is there funding for vocational training?
- B What does vocational education cost and who pays?
- B Develop commissions/panels of highly qualified citizens and headed by nonbiased agencies to recommend changes in vocational education
- B What economic and education policies affect the structure and curriculums of high school vocational educational and how?
- C Research that focuses on nationwide policy issues
- C Reconcile professional education reform initiatives with needs of vocational education

- C How vocational education programs should be planned, implemented, evaluated, modified, and eliminated
  - C Cooperation in federal initiatives
- 

Category 5: Communications, Marketing, Public Relations

- A How can vocational education enhance and communicate its relevant benefits to:
    - a. society
    - b. customers and clients of business/social institutions
    - c. owners and managers of those institutions
    - d. students and their families?
  - A Priorities should be researched and dissemination of research findings, not the development of instructional materials
  - A Develop a liaison with companies to ascertain the types of jobs that will be developing in their companies
  - B Develop marketing strategy to improve image of vocational education at secondary level
  - C Updating image of vocational education in light of technological development
-

Category 6: Delivery Systems and Levels

- A Articulation between secondary and postsecondary for vocational programs
  - A Structure of vocational education delivery system, impact on students
  - B Develop applied vocational programs (vocational education for grades K-6)
  - B Map a landscape between private and public deliverers of occupational-vocational education and training
  - C Coordination of vocational education programs with other education and training activities
  - C Cooperative venture eliminating competition between and among occupational areas
- 

Category 7: Miscellaneous (Lacked 70% Agreement on Comparison)

- A Disseminate research findings to schools, employers, and general public
- A How can vocational education articulate/collaborate with other training delivery systems such as JPTA?
- A How can vocational education keep up with high tech in dollars and training of instructors?
- A Investigate methods to introduce advanced instructional technology: e.g., electronic delivery or simulation



- A What can be done to strengthen the national, state, and local advisory groups?
- A Get teacher involved in industry for updating and work ethic, etc.
- A Look at requirements of small business
- A Examine vocational education curriculum from the concept of career life development as different from skills training
- A Develop strategies for marketing/advertising vocational education that avoid historical stereotypes
- A Articulation between the world of work and vocational training
- A Useful application of work skill while still in school--coop work place
- A Are there significant differences regarding the several subject areas of vocational education?
- A Identify and research barriers and new and better ways to involve business and labor with vocational education
- A Perception that vocational education students are capable of being literate
- A Relate to educational needs for the job and evaluate vocational education in light of that
- A We don't want vocational education to be too narrow

- B Develop a system for describing, reporting vocational education activities in the nation
- B Vocational education's role in meeting needs of youth grades 9-10 prior to program availability in grades 11-12 (also related to dropout prevention programs)
- B Recognition of different learning styles and development of structures to meet these styles
- B Adult vocational education research related to:
  - a. occupation and job transition
  - b. effective guidance and counseling strategies with adult learners
  - c. interface with organized labor
  - d. literacy
  - e. basic skills vs. specialized skills
  - f. partnerships between private and public sectors
  - g. functional skills, dichotomy of occupations
  - h. funding
  - i. organizational structures
- B New credentials for students beyond report cards and transcripts
- B Youth adult vocational education research related to:
  - a. basic skills vs specialized training
  - b. literacy
  - c. minorities

- d. secondary/postsecondary relationships
  - e. cooperative education strategies
  - f. interface with military occupational requirements
- B How to better link specialized systems around the needs of a student (i.e., special education, vocational rehabilitation, etc.)
  - B Determine if there is any evidence that training and credentialing relate to vocational teacher's effectiveness teaching
  - B What is the inventory of skills, knowledge, and attitudes individuals need for successful economic life and how are these currently transmitted to students?
  - B Structure for identifying transferable skills and methodology for applying to vocational programs--knowledge by students for lateral job transfer as well as job ladder/advancement
  - B Research the effectiveness of various technologies of teaching, especially of adults
  - B How to better utilize assisting devices and adaptive equipment in vocational education and the work place
  - B How can weak or ineffective vocational programs be strengthened?
  - B Conduct research which will lead directly to improved teaching materials and approaches

- B Interaction of sources of education and training for preparation for work: school, home, community, work, mass media
- B Identify program characteristics associated with retention
- C Interaction of work and family
- C Research of teacher education structure and curriculum
- C Utilization of career development information (adult populations, retraining, career changes)
- C To learn of society's needs for trained personnel
- C Utilize work experiences to improve educational outcomes
- C Implementing and evaluating transition models for a variety of communities
- C To examine client wants in relation to vocational preparation
- C Institutional characteristics that distinguish excellent from good schools
- C Collaborative school university research
- C Articulating vocational education with secondary programs in international countries
- C Improved articulation between secondary and post-secondary programs

- C Means for integrating vocational education with academic education at secondary level
  - C Developing a conceptual framework for vocational education
  - C Reexamining purposes of vocational education
- 

<sup>a</sup>A = business and industry response; B = public agency or research/policy institute response; C = university response

fourth step of the NGT process previously described. For the two responses ranked at 3.5 for the public policymakers' group, the score was a tie.

Three of the 5 top-ranked priorities for vocational education research (Table 2) by business and industry persons are in the "Competencies, Content, and Instructional Methods" category as presented in Table 1. Neither of the other two groups had any of their top ranked responses placed in this category. This finding indicates a strong interest of the business and industry participants in the content and substance of the vocational education curricula. Conversely, university researchers had two of their top ranked responses classified in the "Equity and Access" category (as was one response from business and industry) which may reflect the recent focus in vocational education legislation and research on equity and access issues.

As shown in Table 3, the 23 participants--randomly assigned into three groups--generated 89 responses to the question, "What are the research and development needs related to vocational education professionals (e.g., teachers, administrators, state staff personnel)?" The responses were categorized by a panel of experts into 5 major categories: (a) "Competencies, Training Systems, and Training Experiences" (24 statements); (b) "Certification, Standards, and Assessment" (5 statements); (c) "Structure, Staffing, Rewards, and Administration" (16 statements); (d) "Demographics and Descriptive Data" (5 statements); and (e) "Miscellaneous" (39 statements). Again, the "Miscellaneous" category contains responses for which there was not at

Table 2

Top-Ranked Priorities for Vocational Education Research and  
Development Based on NGT Session Outcomes

---

Group A (Business and Industry)

1. Defining nonoccupation work place and social skill requirements for the future
2. Structure of vocational education delivery system: impact on students
3. Competency standards for programs, students, and instructors
4. How can vocational education contribute to improve teaching of basic skills and critical thinking?
5. How can vocational education improve services to at-risk populations; e.g., dropouts?

---

Group B (Public Policymakers)

1. What is the inventory of skills, knowledge, and attitudes individuals need for successful economic life and how are these currently transmitted to students?
2. Structure for identifying transferable skills and methodology for applying to vocational programs--knowledge by students for lateral job transfer as well as for job ladder/advancement

- 3.5 Develop a system for describing, reporting vocational education activities in the nation
  - 3.5 To project accurately job opportunities in various occupational areas
  - 5. Identify program characteristics associated with retention.
- 

Group C (University Researchers)

- 1. Research that focuses on nationwide policy issues
  - 2. Means for improving equity
  - 3. Research of teacher education structure and curriculum
  - 4. Research on at-risk youth (feminization of poverty, limited English proficiency, handicapped, disadvantaged)
  - 5. To learn of society's needs for trained personnel
-



least 70% agreement among the members of the panel as to the category for the responses.

The top 5 priority responses for the three randomly assigned groups, listed in 1 through 5 order for each group, appear in Table 4. Each of the 3 groups had at least 2 (Group A had 3) of their 5 top ranked statements placed in the "Competencies, Training Systems, and Training Experiences" category (Table 3). The high priority for these responses undoubtedly reflects the extant literature on effective teaching and reform in teacher education.

#### Conclusions and Implications

The purpose of the NGT conference detailed in this monograph was to determine future research priorities for vocational education research and development and for vocational personnel development. The 23 conference participants were some of the nation's leading thinkers and futurists representing business and industry, public policy, and vocational education research. The priorities they identified through participation in NGT sessions and the classification of their responses into broad topics or categories should have implications for future research in vocational education.

The following conclusions and related implications emanating from this "think tank" conference are offered to guide researchers and policymakers in their future work in vocational education.

1. Six broad categories of research may be used as a basis from which to design future research activities in vocational education: (a) "Competencies, Content, and Instructional Methods"; (b) "Equity and Access"; (c) "Vocational Education Data"; (d) "Policy"; (e)

Table 3

Research and Development Needs Related to Vocational  
Education Professionals

---

Category 1: Competencies, Training Systems, and Training  
Experiences

- o What experiences in business and education will help and keep individuals up-to-date?
- o Means for developing more effective personnel
- o Better understanding of how to teach and train at risk students
- o What skills do vocational educators need to participate more effectively with other educators and human service providers at all levels?
- o What can we do to develop in vocational education professionals a better understanding of business needs, values, cultures?
- o Conduct more school based university research
- o What are the skills vocational educators should have in order to facilitate and increase the use of assistive, adaptive, and instructional technologies and devices?
- o How to relate specialized training to broader social issues
- o What teacher education models will produce students competent to participate in cooperative work settings?

- o Effectiveness of trade competency testing for academic credit
- o How do we maintain the technical skills of vocational education teachers?
- o Articulating industrial-cooperative training programs with the need of industry
- o Need system to deal with unique training problems
- o Development of computer literacy programs for vocational teachers and plans for integration in the curriculum
- o Planning and implementing of inservice training programs for vocational education professionals
- o Experiences/programs for student selection of vocational teaching as a professional-institutional screening and a progress monitoring system
- o Opportunity for upgrading and reworking one's instructional skills and knowledge on a regular basis in cooperation with private industry to include both management and instruction
- o Using staff development to promote strategies for integrating employability skills
- o Improvement of teacher competencies in the advisement of students including assisting students in confirming their choice of programs and including other skills such as job hunting, etc.
- o Instructional needs assessment, planning, implementation, and evaluation

- o Strategies for updating curriculum and instructional staff competencies
  - o Assess and provide for continuing professional education needs
  - o Inservice, hands-on instruction for vocational educators on the use of instructional technology in the classroom
  - o Ethics and work habits--include in curriculum
- 

Category 2: Certification, Standards, Assessment

- o Certification of requirements for becoming ancillary professionals in vocational education
  - o Determine success measurements for research, teacher educators, and service delivery
  - o Teacher success criteria as measured by student success
  - o How can credentialing requirements be altered to allow "nonteachers" to teach?
  - o Develop and disseminate professional standards for the use of psychological tests by administrators, teachers, counselors, etc.
- 

Category 3: Structure, Staffing, Rewards, and Administration

- o Compensation and benefits vis a vis competing positions in business and industry

- o How to cope with (balance) parochial constraints of educational administrators that conflict with their vocational education capabilities and contributions
- o How does structure impact on assignment of professionals?
- o What staffing patterns maximize the effectiveness of the instructional process (e.g., career ladders, teaching teams)?
- o Opportunities for interdisciplinary cooperation with nonvocational and other subject areas
- o Defining ideal structure for administering vocational education (professional mix)
- o Effects of performance-based pay for vocational teachers
- o Relationship between vocational education professionals and other professionals
- o Funding for keeping technologies up-to-date
- o Who is and should be responsible for student placement function?
- o Concepts and approaches to marketing vocational education to potential students and their parents
- o Develop strategies for establishing effective and enduring industry participation
- o Involve vocational educators in international activities directed toward understanding the global economy
- o Occupational relationships to programs and transferable skills to other areas (teacher knowledge and integration into program content)

- o Wider distribution of excellence results to local vocational education programs (model programs)
- o Understanding organizational structure of different deliverers of vocational education

#### Category 4: Demographics and Descriptive Data

- o What is (racial, ethnic, sex, disability) demographic profile of professionals in vocational education and what strategies may be effective for recruiting under-represented populations?
- o Development of a national resource data base for instructors
- o Using longitudinal studies as a follow-up of employability
- o Develop a system to obtain accurate employment data for designing new and emerging curricula
- o Impact of technology and time on occupational education planning and the teaching process itself

#### Miscellaneous

- o How to provide a better understanding of politics and the political process
- o What are the skills person doing vocational assessment and guidance should have to more accurately predict student success in vocational education and employment?

- o How to distinguish between deepening one's own specialty and merely spilling over into other specialities
- o What policies promote retention of good teachers?
- o Better knowledge and use (collaboration) with private industry, JTPA, government
- o What impact does liberal arts education have on teaching effectiveness?
- o Evaluating performance-based compensation systems in relation to attracting and retaining good teachers and performance
- o How to attract public and political support of vocational education needs
- o Study relationships among LEAs, SEAs, and IHEs
- o What are the resources for training and advancement opportunities of vocational education professionals?
- o What are the appropriate roles of teachers, professional organizations, unions, and higher education in the teacher education process?
- o Professional status of vocational teachers
- o Need to understand professional environmental mix
- o Determine value of credentialing and formal training process
- o 3 + 5 + selection and remuneration of all professionals
- o To know the needs and wants of the constituents they are serving

- o Examine opportunities for personnel exchange with business and industry
- o How can basic skills be taught by vocational teachers?
- o Comparison of staff effectiveness and efficiency in for-profit and nonprofit training institutions
- o The effectiveness of vocational student organizations
- o Business/education partnerships for skill acquisition and upgrading of vocational education personnel
- o Familiarization of the vocational education professional with the complex needs of the adult learner (and youth)
- o Restudy the instructional structure of vocational education in terms of its instructional environment, various student abilities and diversities, at-risk students, and the articulation between secondary and postsecondary students
- o Effective utilization of teacher competency testing results
- o Occupational ladders and related required functional skills by priority
- o Study dissemination of research results to instructors, administrators, and general public using modern technology to allow interactive modes
- o Role of vocational education in learning to learn curriculum from K-12
- o Familiarization with the development of increasing collaboration between employers and educators



- o Develop liaison with companies to ascertain the types of jobs that are developing within their industries, within their medium-range plans to determine educational needs for developing jobs
- o Interdisciplinary strategies to reach and recruit at-risk youth before dropout occurs
- o Develop practical strategies for routine local evaluation of vocational education programs
- o Reassess higher education curricula for training of vocational personnel
- o Assessing the integration of training delivered by business into vocational education in the community
- o Interpretation of vocational assessment results into appropriate program plans
- o Clarification of the critical role of vocational educators in maximizing the effects of vocational student organizations
- o Reevaluation of counseling and guidance in the elementary and secondary schools in respect to the relationship between vocational and general education in their training
- o Understanding the role of vocational education in economic development policy decisions
- o Assessing needs of workers for emerging small business versus large corporations (entrepreneurship)

Table 4

Top Ranked Priorities for Research Related to Vocational  
Personnel Development

---

Group A

1. Better understanding of how to teach and train at-risk populations
  2. What can we do to develop in vocational education professionals a better understanding of business needs, values, cultures?
  3. What skills do vocational educators need to participate effectively with other educators and human service providers at all levels? (Opportunities for interdisciplinary cooperation with nonvocational and other vocational education subject areas)
  4. What policies promote retention of good teachers?
  5. What is (racial, ethnic, sex, disability) demographic profile of professionals in vocational education, and what strategies may be effective for recruiting underrepresented populations?
- 

Group B

1. Selection, credentialing, training success criterion as measured on student success as related to all professionals<sup>a</sup>

2. Business/education partnerships for skill acquisition and upgrading of vocational education personnel
  3. How can basic skills be taught by vocational teachers?
  4. Comparison of staff effectiveness and efficiency in for-profit and nonprofit training institutions
  5. Planning and implementation of inservice training programs for vocational education professionals
- 

#### Group C

1. Opportunity for upgrading and reworking one's instructional skills and knowledge on a regular basis in cooperation with private industry to include both management and instruction
2. Instructional needs assessment, planning, implementation, and evaluation
3. Familiarization of the vocational education professional with the complex needs of the adult learner (and youth)
4. Reevaluation of counseling and guidance in the elementary and secondary schools with respect to the relationship between vocational and general education in counselor training
5. Restudy the instructional structure of vocational education in terms of its instructional environment,

various student abilities and diversities, at-risk students, and the articulation between secondary and postsecondary students

---

<sup>a</sup>This is a consensus statement approved by Group B based on several items appearing in Table 3.

"Communications, Marketing, and Public Relations;" and (f) "Delivery Systems and Levels." Other topics may also be appropriate and have been identified in this study under a category labeled as "Miscellaneous."

2. In general, business and industry personnel give priority ratings to research activities in the "Competencies, Content and Instructional" category; others active in vocational education research and policy issues rate "Equity and Access," "Vocational Education Data," and "Policy" as their priority areas for research in vocational education.

3. Four broad categories of research may be used as a basis from which to design future research activities in vocational personnel development: (a) "Competencies, Training Systems and Training Experiences"; (b) "Certification, Standards, and Assessment"; (c) "Structure, Staffing, Rewards, and Administration"; and (d) "Demographic and Descriptive Data." Other topics may also be appropriate and have been classified in this study under the category of "Miscellaneous."

4. In general, participants in this conference gave priority ratings to vocational personnel research activity in the "Competencies, Training Systems, and Training Experiences" category.

5. Setting aside the ranking and classification procedures, the responses that emerged in the original list do demonstrate statements of major concern and should have a significant influence on the ultimate pattern of research in vocational education. These statements represent some of the best thinking about vocational education research and personnel issues. They are based upon critical analysis, experience, public policy issues, and interaction with personnel from diverse public universities, public policy agencies, and business and industry.

6. Finally, the development team for this conference acknowledged the benefits of the NGT process as described by previous researchers and summarized by Stephenson, Michaelson, and Franklin (1982). The NGT groups did indeed focus on the research questions, generated a large number of responses, and stated well their views, stances, individual positions, and preferred ideas in an atmosphere of egalitarianism.

## References

- David, H. (1983). A summing up. In H. David, H. F. Hjelm, & R. C. Harris (Eds.). Vocational education research in the 1980s. Bloomington, IN: American Vocational Education Research Association in cooperation with the Indiana University Publication Office.
- David, H., Hjelm, H. F., & Harris, R. C. (Eds.). (1983). Vocational education research in the 1980s. Bloomington, IN: American Vocational Education Research Association in cooperation with the Indiana University Publication Office.
- Delbecq, A. L., Van de Ven, A. H., & Gustafesen, D. (1975). Group processes for program planning: A guide to nominal group and Delphi process. Glenview, IL: Scott, Fores & Co.
- Gepsen, J., Martinko, M. & Belina, J. (1981). Nominal group techniques: A diagnostic strategy for training needs analysis. Training and Development Journal, (September), 78-83.
- Kaiser, S. M., & Woodman, R. W. (1985). Multidisciplinary teams and group decision-making techniques: Possible solutions to decision-making problems. School Psychology Review, 14(4), 475-470.
- Ludden, L. L., & Wood, G. S., Jr. (1987). Practice driven research: A model for bridging the gap between research and practice. Lifelong learning: An omnibus of practice and research, 10(5), 21-25.
- Miles, M. B., & Huberman, A. M. (1984). Qualitative data analysis. Beverly Hills, CA: Sage Publications, Inc.
- Moore, C. M. (1987). Group techniques for idea building. (Applied Social Research Methods Series, Vol. 9). Beverly Park, CA: Sage Publications, Inc.
- O'Neil, M. J., & Jackson, L. (1983). Nominal group technique: A process for initiating curriculum development in higher education. Studies in Higher Education, 8(2), 129-138.
- Scott, D. & Deadrick, D. (1982). The nominal group technique: Applications for training needs assessment. Training and Development Journal, (June), 26-33.
- Stephenson, B. Y., Michaelson, L. K., & Franklin, S. C. (1982). An empirical test of the nominal group technique in state solar energy planning. Group & organization studies, 7(3), 320-334.
- Ulschak, F. L. (1983). Human resource development: The theory and practice of need assessment. Reston, VA: Reston Publishing.

- Van de Ven, A. H., & Delbecq, A. L. (1974). The effectiveness of nominal, delphi, and interacting group decision-making processes. Academy of Management Journal, 17, 605-621.
- White, S. E., Dittrich, J. E., & Lang, J. R. (1980). The effects of group decision-making process and problem-situational complexity on implementation attempts. Administrative Science Quarterly, 25, 428-429.



APPENDIX A

NOMINAL GROUP TECHNIQUE SESSIONS, PARTICIPANTS

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IN

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APPENDIX B

NOMINAL GROUP TECHNIQUE SESSIONS,  
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NOMINAL GROUP TECHNIQUE SESSIONS

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PLANNING GRANT PROPOSAL

NATIONAL CENTER FOR RESEARCH  
IN  
VOCATIONAL EDUCATION

Sponsored by Virginia Tech  
May 12, 1987  
Washington, D.C.

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## Foreword

The Division of Vocational and Technical Education, Virginia Polytechnic Institute and State University, was awarded a planning grant by the United States Department of Education to conduct planning activities associated with preparing an application for a National Center for Research in Vocational Education. The major activities of the grant focused on conducting qualitative research to chart the future direction of research and development in vocational education.

Outcomes of one of the activities of the grant are detailed in this report. It explains procedures followed in securing priorities for needed research in vocational education from organizations that are major providers of such research. Input provided by key individuals within the organizations is compiled and analyzed in this report. Support for areas of vocational education research previously identified as important and implications for new areas of vocational education research are summarized.

This report was written by Dr. B. June Schmidt with assistance from Dr. Nevin R. Frantz, Dr. Richard L. Lynch, and Shirley Hall.

Note: The contents of this report were developed under a grant from the U. S. Department of Education. However, the contents do not necessarily represent the policy of the Department of Education, and it should not be assumed that they are endorsed by the Federal Government.

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## Introduction

Determining the substance of and priorities for vocational education research have concerned educational leaders, vocational educators, and legislators for many years. The Committee on Vocational Education Research and Development (COVERD) prepared a report in 1976 that looked at vocational education research priorities of the U.S. Office of Education for the previous decade (Evans, 1983). The study that served as the basis for the report took more than a year to complete. It examined how \$250 million of Federal funds for vocational education research and development had been used in a 10-year period.

As Evans (1983, p. 3) indicated, COVERD did not have the charge to suggest research topics; rather, it looked at past research priorities. Nine major research categories emerged that seemed to encompass the great majority of Federally-funded vocational education research during the decade before 1976. They were:

- o Career development and guidance
- o Students with special needs
- o Characteristics of students
- o Teacher education
- o Instructional techniques
- o Curriculum development
- o Labor market supply and demand information

- o Administration of vocational education
- o Evaluation of vocational education programs

More recently, Seidman (1986) detailed the findings of an analysis of trends in vocational education research for the 20-year period 1963-1983. He used two major sources of data: (a) individual research and development efforts reported through dissertations and in articles appearing in the Journal of Vocational Education Research and in the Journal of Industrial Teacher Education and (b) government research and development efforts at both the Federal and state levels reported in various sources. For his initial content analysis, Seidman used the nine major research categories identified by COVED. As an outcome of a "geological" analysis procedure he used that focused on "level of effort," Seidman concluded:

Within the 20 years studied [1963-1983], vocational education R & D comes across as a diffused and unfocused activity spread across so many areas that the advancement of vocational education as a discipline should be questioned.

Any trends that did emerge were short-lived; the patterns of influence between the two fields studied--individual R & D and government R & D--were inconsistent and therefore inconclusive.

(p. 57)

In 1982, a Colloquium on Vocational Education Research in the 1980s was sponsored by the American Vocational Education Research Association in cooperation with the Coordinating Committee on

Research in Vocational Education. The major thrust of the Colloquium was to identify research priorities for vocational education. In the introduction to the Colloquium proceedings, Hjelm (1983) stated:

A major and dramatic shift is now in the making with respect to the Federal role in education and in support of educational research, including research on vocational education and related activities. Federal expenditures on educational research have been reduced in recent years and the priorities of the Federal agencies that support educational research have been changing. (p. 3)

Hjelm noted that the timing of the Colloquium was most opportune for considering the building blocks out of which an effective research agenda on vocational education could be constructed for the 1980s. Based on papers of the Colloquium participants, David (1983) summed up their suggestions for future research in six categories. In substance they were:

- o Change. A pervasive theme of the papers is the need to focus on change as it is occurring in the larger societal and economic environments within which vocational education exists.
- o Students. A less pervasive theme, yet one frequently occurring in the papers, students has three thrusts: (a) providing more information about the needs and characteristics of vocational students and about the duration and intensity of their vocational studies, as well as their transition from school to work; (b) ensuring that up-to-date program offerings, curricula and related instructional materials, and machines and tools are

available; and (c) expanding and improving what is known about the effects of participating in vocational education programs upon learners.

- o Educational Processes. Related to the student-oriented research and development theme, studies of educational processes and those emphasizing improved instructional instruments, including curricula and teaching techniques, surfaced as a third major theme.
- o Resources for Research and Development and Their Allocation. This research and development theme encompasses concerns about allocations of resources, establishing priorities for systematically planned research and development programs, developing well-trained research personnel, and undertaking efforts of recognized worth with limited resources.
- o Getting a Better Handle on the Future. The thrust of this theme is that if vocational education could secure a better handle on the future, particularly in respect to labor market supply and demand, it would gain the time needed by institutions delivering vocational education to respond to the dynamics of economic and social changes.
- o Information and Knowledge for Policy Making. A number of the papers make the point that policy makers at every level of government would benefit enormously from research seeking to produce information and knowledge usable for policy assessment, modification, and formulation; i.e., policy making.



David cautioned that the summing up he provided naturally reflected his personal perceptions of the papers presented at the Colloquium.

In a vein similar to that of David, Phelps and Hughes (1986) offered suggestions about research on vocational education in the secondary schools. Their suggestions stemmed from recommendations and observations of the National Commission on Secondary Vocational Education (NCSVE), which were published in The Unfinished Agenda (1984). The suggestions fell into three broad research categories: educational research, policy research, and evaluation research. Within each of the three categories, topical issues were identified.

In the educational research category, Phelps and Hughes noted that "Perhaps the most pervasive and central problem identified by the NCSVE is the need for vocational education at the secondary level to address the matter of basic skills" (p. 57). The other two topics of concern they identified in the educational research category were the improvement of teacher education and the need for vocational programs to address work and family issues, especially through the revision and expansion of curricula. They emphasized that "Important as work is to families--as families must be to the worker--present data do not include studies of the relationship itself" (p. 60).

In the category of policy research, Phelps and Hughes identified three major areas for research as emerging from the NCSVE report: access, equity, and field-based learning. They stressed that "Many of the access recommendations focus on improving the recruitment, guidance, and counseling processes" (p. 62). Questions regarding

equity issues that surfaced in The Unfinished Agenda included determining "What policies seem to be effective in minimizing bias and stereotypes held by students and parents regarding occupations and related vocational education programs?" (p. 63). Field-based teaching issues, they noted, must focus on the viability of such learning.

For evaluation research, Phelps and Hughes suggested two categories of research for assessing student achievement: (a) longitudinal studies and (b) local studies of students. The NCSVE, they stated, ". . . makes only one recommendation on accountability, that is, that the effectiveness of instruction be judged by gains in students' knowledge, skills, and attitudes" (p. 64). Thus, evaluation research must be directed toward assessment of the value of vocational programs to students.

Naturally, much overlap occurs among the nine major research categories that COVERD identified for Federally funded vocational education research completed in the 10 years prior to 1976, the suggestions that David summarized from the Colloquium on Vocational Education Research in the 1980s, and the NCSVE implications for research enumerated by Phelps and Hughes.

There were five new topics, however, that emerged from the Colloquium and NCSVE:

- o Impact of future work place and societal changes on vocational education
- o Information and knowledge for policy making

- o Basic skills development through vocational education
- o Access and equity issues
- o Interrelationships between work and family

Quite clearly, the topics of concern for vocational education research and development evolve over time. Further, priorities for the research and development activities differ over time, often depending on the availability of funds as noted by Evans (1983), David (1983), and Seidman (1986). Thus, determining priorities for future research and development continues to be important and of interest to vocational educators and legislators. One source for determining priorities for future vocational education research and development is input from organizations that are current major providers of the research and development.

#### Procedures

As a first step in gathering input from such organizations, current providers of vocational education research and development had to be identified. A list of the organizations was compiled in the Division of Vocational and Technical Education at Virginia Polytechnic Institute and State University. The Division's faculty members in general vocational education and in six vocational program areas (agriculture education, business education, marketing education, home economics education, industrial arts education, and vocational industrial and health occupations education) were asked to provide names of appropriate organizations and contact individuals. A total of 49 organizations were identified and a key individual

within each was telephoned to request input. The organizations included private industries, government agencies and bureaus, national commissions, and curriculum networks.

A member of each of the 49 organizations agreed to complete a questionnaire consisting of six items:

- o Name of organization responding, including address and phone number
- o Person providing information
- o Mission/purposes of organization
- o Summary or status of existing research and development completed and/or currently in process
- o Important findings and conclusions
- o Prioritized areas of needed research for vocational education

The rate of survey response was 63%. Of the 31 responses received, 3 respondents indicated that their organizations were unable to provide applicable information. Appendix A includes a list of the 28 organizations that did respond with usable information.

#### Findings

The findings include compilations of the mission/purposes, existing research and development, any important research findings and conclusions emanating from the organizations, and priority areas for needed research as identified and reported on the questionnaire by the respondents.

### Mission/Purposes and Existing Research and Development of the Organizations

Along with a list of the 28 responding organizations, Appendix A contains summary statements describing the mission/purposes of each. All of the organizations operate on a not-for-profit basis. Some conduct research themselves, while others support research conducted by outside individuals and organizations. Purposes of the organizations include developing a more productive and capable work force, developing and distributing vocational curriculum materials, improving relationships between institutions of work and learning, providing occupational information, assessing student achievement, and promoting the welfare of wage-earning women.

Many of the respondents combined their answers for the fourth and fifth items on the survey instrument, the statements asking for information about their existing research and development and for findings and conclusions. Hence, responses to the two items have been combined for compilation purposes. Appendix B contains summary descriptions of information from the two items for each organization. Examination of the descriptions provides no prevailing themes for the existing research and development. Much of the research is a direct outgrowth of the stated mission/purposes of the specific organizations, with development being mainly of vocational curriculum materials.

### Priority Areas for Needed Research in Vocational Education

The respondents generated a total of 122 statements regarding priorities for needed research in vocational education. The number

of statements per respondent ranged from 1 to 10, with 3 to 7 statements being provided most often. The statements have been arbitrarily categorized in six major topical areas: "Program Development and Improvement," "Policy Studies in Vocational Education," "Effectiveness in Vocational Education," "Basic Skills Development in Vocational Education," "Collaborative Relationships in Vocational Education," and "Vocational Personnel Development." A list of the six topical areas, along with the titles and numbers of items in the subtopics for each, appears in Table 1. The major topics and related subtopics are listed in order of those with the most statements to those with the least. The number of statements per major topic ranged from 33 to 14.

Table 2 provides a listing of the 33 priority statements for needed research related to vocational program development and improvement. (Note: Tables 2 through 6 list the statements exactly as provided by the respondents on the questionnaires. Content editing was not undertaken to avoid the possibility of making a substance error. Only obvious spelling or punctuation errors were corrected.) The statements are divided among four subtopics. The first of these, "Delivery of Vocational Education to Students with Special Needs," consists of 14 statements. The students with special needs are of three types: women, students legally classified as having special needs, and displaced workers.

The second subtopic, "Subject Area Analyses and Teaching Models for Vocational Education," contains 9 statements. They are aimed at

concerns about emerging technologies and occupations, employability versus skill development versus educational goals, and examination of tasks and duties of specific jobs. The third subtopic, with 7 statements, addresses issues of "Delivering Vocational Education in Various School Settings." The settings include isolated communities, private schools, and comprehensive high schools. In addition, concern is expressed about offering "prevocational" and "pretechnical" preparation any school setting. Finally in this topical area is the subtopic of "Student Organization Improvement," with 3 statements.

The priority statements for the second topical area appear in Table 3. Twenty-five statements emerged that are directed toward concerns about research related to policy studies in vocational education. The 25 statements are divided among four subtopics. The first "Workforce/Workplace Changes Related to Changing Technology, Changing Demographics, and a World Wide Economy," has 10 statements focusing on the need for policymakers to be aware of ever-impending "changes" in our society and of their impact on vocational education.

"Clarifying the Role of Vocational Education," with 6 statements, is the second subtopic for research related to policy studies. These statements speak to the need for establishing future standards and goals for vocational education as well as the need for better data to be used for vocational education planning. The third subtopic, also with 6 statements, is "The Federal Role in Vocational Education."

Most of these statements encompass the notion of accountability in the use of Federal funds. The final subtopic, "Vocational Education's Role in Economic Development," has 3 statements.



Table 1

Priority Statements for Needed Research by Topical Area

Topic/Subtopic	Number of Statements
1. PROGRAM DEVELOPMENT AND IMPROVEMENT	
Delivering Vocational Education to Students with Special Needs	14
Subject Area Analyses and Teaching Models for Vocational Education	9
Delivering Vocational Education in Various School Settings	7
Student Organization Improvement	<u>3</u>
Total	33
2. POLICY STUDIES IN VOCATIONAL EDUCATION	
Workforce/Workplace Changes Related to Changing Technology, Changing Demographics, and a World-Wide Economy	11
Clarifying the Role of Vocational Education	6
The Federal Role in Vocational Education	6
Vocational Education's Role in Economic Development	<u>3</u>
Total	26
3. EFFECTIVENESS OF VOCATIONAL EDUCATION	
National and Local Program Effectiveness, Including Cost Effectiveness	7
Effectiveness in Helping Students Make the Transition to Work	5
Effectiveness in Meeting Employers' Needs	4

Table 1 (continued)

Topic/Subtopic	Number of Statements
Effectiveness in Meeting Students' Needs	<u>4</u>
Total	20
4. BASIC SKILLS DEVELOPMENT IN VOCATIONAL EDUCATION	
Identifying Basic Skills/Core Competencies	8
Teaching, Assessing, and Documenting Basic Skills	<u>7</u>
Total	15
5. COLLABORATIVE RELATIONSHIPS IN VOCATIONAL EDUCATION	
Enhancing the Role of Business, Industry, and Labor in Vocational Education	9
Articulation Among Vocational Programs	<u>5</u>
Total	14
6. VOCATIONAL PERSONNEL DEVELOPMENT	
Improving Vocational Teacher's Professional Competence	4
Preparing Leadership Personnel in Vocational Education	3
Providing Occupational Experiences for Vocational Teachers	3
Vocational Teacher/Specialist Staffing Pattern Concerns	<u>3</u>
Total	14
Combined Total	122

Table 2

Priority Statements for Needed Research Related to Vocational Program Development and Improvement

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DELIVERING VOCATIONAL EDUCATION TO STUDENTS WITH SPECIAL NEEDS

- o Meeting the needs of special populations
- o Involvement of latch key youth in vocational education programs during after-school hours
- o Vocational education and displaced homemakers
- o What can vocational education do to improve the working conditions of women, increase their efficiency, and advance their opportunities for profitable employment?
- o Maintaining students in courses nontraditional to their gender
- o Sex bias in vocational education
- o Methods or processes to ensure that special-needs students leave the secondary school system with:
  - Entry-level skills and a transition to work and the adult life
  - Skills needed to transition to a postsecondary or additional education experience that leads to transition to work and the adult life
  - Transition to a community-based organization to continue skill development which hopefully leads to work and the adult life or a most suitable alternative
- o Research to ensure that career and prevocational skills are developed which prepare special needs students for vocational education
- o Research to ensure that vocational education is responsive to labor market needs, especially for special-needs students
- o Access and barriers to access for special populations
- o Develop, evaluate, and disseminate national models for retraining adult workers.
- o Develop tools to assist in the identification of alternative occupations and training to facilitate the transition of dislocated workers to employment. Ultimate objective would be the development of automated systems that would assist in identifying alternative employment and training needs.
- o Improve access of adults to career information

Table 2 (continued)

Priority Statements for Needed Research Related to Vocational Program Development and Improvement

- 
- o What is the effect of the changing workplace and the changing worker on the role of postsecondary education, the role of secondary education, the role of community-based organizations in employment and training, and the role of industry in employment and training?

SUBJECT AREA ANALYSES AND TEACHING MODELS FOR VOCATIONAL EDUCATION

- o Develop national models for public school curricula in emerging technologies
- o Develop improved information on the subject issue items. Carry out a study or series of studies that develop information to help define which occupations are more typically entry-level occupations and examine the feasibility of developing career path information on selected occupations.
- o Identification and development of duties and tasks performed by individuals in priority occupational areas
- o Streamlining of task analysis techniques to achieve greater local acceptance
- o Entrepreneurship training versus vocational education
- o Employability versus skill development--model of training, placement, "nurturing," and follow-up in community setting
- o What are the educational goals and priorities for students who want to go to work as compared with those who want to go on to postsecondary education? What are the rationales for commonalities and differences?
- o The degree to which the learning styles of program recipients are utilized for the delivery of program outcomes
- o Analysis of curriculum development techniques

DELIVERING VOCATIONAL EDUCATION IN VARIOUS SCHOOL SETTINGS

- o Myths concerning vocational education, e.g., only nonacademic students take vocational education classes
- o Applications of school improvement techniques to vocational education classrooms

Table 2 (continued)

Priority Statements for Needed Research Related to Vocational Program  
Development and Improvement

- 
- o Delivery of vocational education/job training in small and isolated communities
  - o The availability of vocational education in private secondary schools
  - o Value of merging vocational education into a comprehensive high school program
  - o Develop "pretech programs" for providing "legitimate" access to advanced-level postsecondary technologies, include evaluation/dissemination
  - o Research on programs that would "bridge" the current grade 9-10 gap between prevocation education and traditional grade 11-12 vocational programs

STUDENT ORGANIZATION IMPROVEMENT

- o To access the leadership experiences of student organization members
  - o To analyze characteristics and needs of student organization members
  - o The role of student organizations in vocational education
-

Table 3

Priority Statements for Needed Research Related to Policy Studies in Vocational Education

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WORKFORCE/WORKPLACE CHANGES RELATED TO CHANGING TECHNOLOGY, CHANGING DEMOGRAPHICS, AND A WORLD-WIDE ECONOMY

- o What is the effect on the workplace of changing job skill requirements and emerging technology?
- o To develop information on the impact of technological change on occupational skill requirements and to identify procedures for continued monitoring of such changes
- o Emerging occupations and relevant training needs--vocational or higher education?
- o What is the effect of the changing worker, including the aging worker, the non-English-speaking immigrant, the mainstreamed handicapped person, and the increasing numbers of special populations?
- o What is the impact of a smaller job-entry population for a more technologically oriented and a more highly educated workforce?
- o Implications of changing demographics and economics
- o Develop improved occupational projections at state and local levels to better serve planning and career exploration needs
- o What is the effect on the workplace of increasing numbers of small businesses?
- o What is the effect on the workplace of a world-wide economy?
- o Developing strategies for the U.S. to compete with foreign goods and products
- o What external factors have had a significant impact on vocational education, cooperative work experience education, and transition to work during the past five years? What was the change (i.e., cause/effect)?

CLARIFYING THE ROLE OF VOCATIONAL EDUCATION

- o What is the role of vocational education in a changing labor market that places higher value on a college education (degree) than on practical vocational skills?

Table 3 (continued)

Priority Statements for Needed Research Related to Policy Studies in Vocational Education

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- o Clarifying the role of secondary vocational education
- o What should be the standards and objectives of secondary and post-secondary vocational education for the 21st century?
- o Develop information on current use of occupational information in planning to improve future efforts in this area, ideally the objective would be to identify the impact of occupational information use on vocational education policy and administration practices.
- o Develop guidelines and alternative approaches to developing follow-up data for vocational programs
- o Develop a national crosswalk between higher education and occupations. The subject crosswalk could be used to support planning and career counseling programs as related to higher education. This effort should involve a national resource group that would help verify relationships between higher education programs and occupations using existing crosswalks.

THE FEDERAL ROLE IN VOCATIONAL EDUCATION

- o What should be the accountable function of each of the major Federal programs or agencies engaged in education and job preparation? How can these functions be strengthened?
- o Can Federal data collection make a difference in setting Federal policy?
- o Is the funding for the Carl Perkins Act facilitating implementation of the Act?
- o The effectiveness of the Carl Perkins Act funds to the U.S. territories under the Consolidation Block Grant, P.L. 95-134
- o How has the changed focus of the United States Department of Education, in particular the Office of Vocational and Adult Education (OVAE), affected vocational education, cooperative work experience education, and efforts to improve transition to work? How should OVAE be more helpful?
- o Users of targeted federal vocational education funds; e.g., set asides, program improvement

Table 3 (continued)

Priority Statements for Needed Research Related to Policy Studies in Vocational Education

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VOCATIONAL EDUCATION'S ROLE IN ECONOMIC DEVELOPMENT

- o Improve coordination between vocational education and economic development
  - o Organize a national network of vo-tech institutions or "technology centers" to provide industry training targeted toward economic development and national competitiveness
  - o Develop a microcomputer-based information system designed to support economic development and to encourage the use of existing training programs in preparing employees
-



Twenty priority statements for needed research emerged in the third topical area--statements related to the effectiveness of vocational education. The statements, divided among four subtopics, are listed in Table 4. The first subtopic, which has 7 statements, focuses on "National and Local Evaluation of Program Effectiveness, Including Cost Effectiveness." Generally, the thrust of the statements is that vocational education research should quantitatively measure program effectiveness, particularly with regard to earnings and economic development to justify the existence of the programs.

The subtopic "Effectiveness in Helping Students Make the Transition to Work" has 5 statements. The main theme of the statements is that research should aim to determine what types of vocational learning experiences can help students successfully move from school to work. A subtheme is one of amassing data to determine what student characteristics and experiences relate to making the transition effectively. "Effectiveness in Meeting Employers' Needs," the third subtopic, has 4 statements. They ask that various ways of preparing students to meet employers' needs be examined, especially preparation that is employer-based versus preparation that is school-based. The last subtopic, also with 4 statements, is "Effectiveness in Meeting Students' Needs." These statements question the "benefits" or "payoffs" of vocational program enrollment and student organization participation for students.

Table 4

Priority Statements for Needed Research Related to the Effectiveness of Vocational Education

---

NATIONAL AND LOCAL EVALUATION OF PROGRAM EFFECTIVENESS, INCLUDING COST EFFECTIVENESS

- o A research and developmental effort on a national scale to demonstrate the acceptable components of effective vocational education; basically, provide the "outsider" with criteria for the existence of vocational education programs
- o What is the impact of vocational education on employment and earnings?
- o Cost effectiveness of vocational training should be studied.
- o Develop and test means to assess program performance
- o Research on how joint vocational schools contribute to economic development
- o Evaluate recently implemented 2 + 2 articulation programs
- o How can vocational education better measure and demonstrate its labor market effect?

EFFECTIVENESS IN HELPING STUDENTS MAKE THE TRANSITION TO WORK

- o What are the characteristics of students who have or have not made a successful transition to work?
- o How have the various studies, reports and recommendations for improving secondary education, including the "unfinished agenda," affected preparation for employment, cooperative work experience education, and the transition to work?
- o What information (data base) are educators using to improve vocational education, cooperative work experience education, and transition to work? How is the information being obtained and utilized?
- o How is cooperative work experience education changing in terms of enrollment, curriculum, placement, on-the-job training, etc.? Why? Are the changes helping transition to work?
- o What labor market information is available, needed, and used effectively for vocational education, cooperative work experience education, and counseling and preparing for transition to work?

Table 4 (continued)

Priority Statements for Needed Research Related to the Effectiveness of Vocational Education

---

EFFECTIVENESS IN MEETING EMPLOYERS' NEEDS

- o Research on the effectiveness of different vocational education strategies for attracting new employers: training workers, then seeking employers versus seeking employers with the promise of customized worker training
- o Effects of (a) customized training and (b) vocational education on plant expansion or location
- o School-based versus employer-based vocational preparation--cross-national comparisons on preparation for world of work
- o Is there significant difference between vocational curricula and labor market needs; can vocational education be restructured from a curriculum into a useful pedagogical method?

EFFECTIVENESS IN MEETING STUDENTS' NEEDS

- o What populations are served--a.k.a., benefits?
  - o What is the payoff for women (girls) for vocational training?
  - o How does the satisfaction of vocational program recipients correlate with adult success?
  - o To measure the effectiveness of student organization participation, particularly as a key relationship to students' futures
-

The fourth topical area for needed research focuses on basic skills development in vocational education. Table 5 contains the 15 statements the respondents provided for this topic. They are divided between two subtopics: (a) "Identifying Basic Skills/Core Competencies" and (b) "Teaching, Assessing, and Documenting Basic Skills." "Just what are the basic skills, employability skills, and core competencies that vocational education should include in its curricula?" is the question to be answered in the 8 statements of the first subtopic. The second subtopic has 7 statements, 5 of which address the teaching of basic skills, 1 assessing the skills, and 1 documenting achievement of them.

The research priority statements in the fifth topical area, listed in Table 6, are directed at concerns about collaborative relationships being developed in vocational education. The two subtopics are "Enhancing the Role of Business, Industry," and "Labor in Vocational Education," with 9 statements and "Articulation Among Vocational Programs," with 5 statements. Statements in the first subtopic propose research in the perspective of a two-way street--business, industry, and labor's role in vocational education and vocational education's role in cooperating with business, industry, and labor. Concerns about lack of coordination among vocational programs at different levels is the overriding theme of the statements in the second subtopic.

Table 5

Priority Statements for Needed Research Related to Basic Skill Development in Vocational Education

---

IDENTIFYING BASIC SKILLS/CORE COMPETENCIES

- o Research to identify/define "basic" vocational skills that would serve as the core for initial vocational education and upon which specialized occupational skills could be built
- o How can the knowledge components be identified that prepare workers with transferable skills and reduce the likelihood of structural unemployment?
- o Changes in skills and knowledge in employees desired by employers; identify what employers want in the way of such characteristics
- o Are basic skills prerequisites for vocational education or should vocational methods be used to teach basic skills?
- o Define transferable skills/core competencies
- o Define employability skills
- o Develop standards and models for achieving adult literacy
- o Identify skills and knowledge needed for future workplace

TEACHING, ASSESSING, AND DOCUMENTING BASIC SKILLS

- o Role of vocational education in teaching basic skills
  - o Ways to integrate basic skills into vocational education curriculum
  - o Identify the knowledge gained by students in the basic skills (math, reading, writing) through vocational skills training
  - o The degree to which basic skills are made relevant through the practical application of concepts within vocational instruction
  - o Redesign vo-tech programs in high school to accommodate applied academic courses
  - o Basic skills infusion/documentation
  - o Documentation of basic skills development in vocational programs
-

Table 6

Priority Statements for Needed Research Related to Collaborative  
Relationship Development in Vocational Education

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ENHANCING THE ROLE OF BUSINESS, INDUSTRY, AND LABOR IN VOCATIONAL  
EDUCATION

- o What should be the role of business, industry, and labor in vocational education; and how can this role be enhanced?
- o Investigate the role that business and industry plays in vocational skills training. What is the amount of support? Develop a linkage between business and industry and local educational programs.
- o Determining how to get greater involvement by the business sector in cooperative education
- o Demonstrate how to get greater involvement by the business sector in cooperative education; how to increase the utilization of cooperative education to prepare students for employment; how to improve the quality of cooperative programs nationwide
- o To what extent does cooperative work experience education help solve educational problems stemming from industries' changes in equipment and procedures?
- o Linking vocational education with employment-based training
- o How can the coordination and articulation of vocational education with the various education and job training programs be improved?
- o Increased collaboration of vocational education with JTPA and the private sector
- o Develop information on how vocational education can work more closely with JTPA and provide services to JTPA. Examine the value of occupational information in facilitating such coordination activities.

ARTICULATION AMONG VOCATIONAL PROGRAMS

- o Articulation of secondary and post-secondary programs
- o The duplication of adult vocational education programs in community colleges, secondary adult community schools, and colleges
- o Develop models for better articulation and communication among secondary and postsecondary vocational education, training, higher education, and economic development agencies

Table 6 (continued)

Priority Statements for Needed Research Related to Collaborative  
Relationship Development in Vocational Education

- 
- o Set up a center which will help avoid duplication of programs.
  - o Develop national models and standards for articulation between  
secondary and postsecondary institutions
-

The sixth topical area, needed research related to vocational personnel development, also has 14 statements. The statements, which are divided into four subtopics, appear in Table 7. The 6 statements in the first subtopic, "Improving Vocational Teachers' Professional Competence," range from implications of current teacher preparation reform movements, to preparing vocational teachers from the world of work to approaches for evaluating vocational teachers. The other subtopics have 3 statements each. The statements related to "Preparing Leadership Personnel in Vocational Education" address both developing training programs for such personnel and assessing future needs for leadership personnel. The title of the next subtopic, "Providing Occupational Experiences for Vocational Teachers," is self-explanatory. The final subtopic, "Vocational Teacher/Specialist Staffing Patterns Concerns," speaks to collaboration among vocational, academic, and special-needs teachers; to staffing patterns/tenure of vocational teachers; and to the preparation of vocational education librarians.

#### Discussion and Implications

Six major topical areas for vocational education research emerged from the preceding summary of the 122 statements provided by the respondents in this study. The respondents represent 28 current major providers of vocational education research and development. Answers to three questions will help explain how the six topics and the statements that comprise each relate to previous actual and recommended topics for vocational education research. The three questions are:



Table 7

Priority Statements for Needed Research Related to Vocational  
Personnel Development

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IMPROVING VOCATIONAL TEACHERS' PROFESSIONAL COMPETENCE

- o Alternative models for development of vocational teaching personnel
- o What implications does the current system reform movement in teacher preparation have for vocational education?
- o Can persons highly competent in the world of work skills be guided through inservice activities to relate positively to reluctant and recalcitrant learners?
- o Teacher currency/updating in training styles
- o More effective approaches for evaluating vocational education teachers leading toward increased professional competence

PREPARING LEADERSHIP PERSONNEL IN VOCATIONAL EDUCATION

- o Develop training programs similar to the "Improve Career Decision-making" (ICDM) program for planners and administrators of vocational education and training programs.
- o Assessment of future leadership personnel needs in vocational education
- o Refinement of state practices for delivering technical assistance regarding curriculum development

PROVIDING OCCUPATIONAL EXPERIENCES FOR VOCATIONAL TEACHERS

- o Alternative systems for providing occupational experiences for vocational teachers
- o More emphasis on private-sector training in teacher education programs
- o Impact of work experience on vocational teachers

VOCATIONAL TEACHER/SPECIALIST STAFFING PATTERN CONCERNS

- o Improving collaboration among vocational, academic, and special needs teachers

Table 7 (continued)

Priority Statements for Needed Research Related to Vocational  
Personnel Development

- 
- o What is the effect of staffing patterns/tenure on vocational education?
  - o The development of a curriculum package for training specialized vocational education librarians and library assistants
-

1. How do statements summarized into six topical areas from this survey compare to the nine topics that the Committee on Vocational Education Research and Development (COVERD) identified as the focus of Federally-funded vocational education research for the decade prior to 1976 (Evans, 1983)?
2. How do statements in the six topical areas compare to the five "new" topics for vocational education research that emerged from David's (1983) summary of papers presented at the Colloquium on Vocational Education Research in the 1980s and Phelps and Hughes (1986) suggestions for vocational education research based on The Unfinished Agenda (1984) published by the National Commission on Secondary Vocational Education (NCSVE)?
3. What new topics for vocational education research have emerged from the 122 statements that were not among the original nine topics or additional five topics noted in Questions 1 and 2?

For the first question, a topic-by-topic comparison follows between the original nine topics that COVERD identified and the six topics and statements that comprise each from this study.

- o Career Development and Guidance. Only 3 of the 122 statements obtained for purposes of this study even mention the idea of career development. None mention guidance. Two of the three statements are included in the first topical

area under the subtopic, "Delivering Vocational Education to Students with Special Needs" (Table 2). One addresses the delivery of career skills to special-needs students; the other concerns the delivery of career information to adults. The third in the subtopic "Subject Area Analyses and Teaching Models for Vocational Education" (Table 2) mentions developing career path information for selected occupations.

- o Students with Special Needs. Fourteen statements, the most in any subtopic, focus on students with special needs. The subtopic "Delivering Vocational Education to Students with Special Needs" is in the major topical area of "Needed Research Related to Vocational Program Development and Improvement" (Table 2). Since originally appearing in needed research listings, topics concerning students with special needs have been expanded to include women and displaced workers.
- o Characteristics of Students. Three of the 122 statements relate to characteristics of students. Two are in the first topical area of program development and improvement (Table 2). One asks for analysis of characteristics and needs of student organization members, the other for examination of the degree to which the learning styles of program recipients are utilized for delivery of program outcomes. The third appears in the topical area on the

effectiveness of vocational education (Table 4). It calls for identification of characteristics of students who have or have not made a successful transition to work.

- o Teacher Education. Eight statements in the topical area of personnel development address teacher education (Table 7). They are divided between two subtopics, "Improving Vocational Teachers' Professional Competence," with 5 statements, and "Providing Occupational Experiences for Vocational Teachers," with 3 statements.
- o Instructional Techniques. Interestingly, none of the 122 statements specifically mention instructional techniques. One statement in the subtopic on students with special needs (Table 2) mentions the use of "methods or processes" to ensure that such students leave the secondary school system with various skills they will need in their adult lives. Another statement, in the subtopic on "Subject Area Analyses and Teaching Models for Vocational Education" (Table 2), also alludes to instructional techniques. It is "develop national models for public school curricula in emerging technologies."
- o Curriculum Development. The 9 statements of the subtopic "Subject Area Analyses and Teaching Models for Vocational Education" (Table 2) focus on curriculum development. Two additional statements speak to concerns about developing prevocational and pretech programs. They are in the

subtopic "Delivering Vocational Education in Various School Settings" (Table 2).

- o Labor Market Supply and Demand. Five statements in the research topic on policy studies in vocational education address labor market supply and demand information (Table 3). Three of them are in the subtopic "Workforce/Workplace Changes Related to Changing Technology, Changing Demographics, and A World-Wide Economy." They focus on the importance of population demographics. Two statements related to labor market supply and demand appear in the subtopic on "Clarifying the Role of Vocational Education." They focus on the need for better vocational education supply/demand data.
- o Administration of Vocational Education. The 3 statements of the subtopic "Preparing Leadership Personnel in Vocational Education" (Table 7) concern the administration of vocational education. They ask for the development of training programs for administrators, for needs assessment of future leadership personnel, and for refinement of administrative practices at the state level related to the delivery of technical assistance.
- o Evaluation of Vocational Education Programs. Still very much a viable topic, the 21 statements on research related to effectiveness of vocational education (Table 4) fit the topic of evaluation of vocational education programs. The

21 statements are divided among four subtopics: "National and Local Evaluation of Program Effectiveness, Including Cost Effectiveness"; "Effectiveness in Helping Students Make the Transition to Work"; "Effectiveness in Meeting Employers' Needs"; and "Effectiveness in Meeting Students' Needs."

Support for the original nine topics identified by COVERD found in the 122 statements can be classified according to the number of statements relating to each. Employing criteria for support of 3 or less statements as indicating "limited or no support," 4 to 7 statements as indicating "moderate support," and 8 or more statements as indicating "extensive support," four topics are classified as having "limited or no support." They are career development and guidance, characteristics of students, instructional techniques, and administration of vocational education. One topic with "moderate support" is labor market supply and demand. Four topics have "extensive support": students with special needs, teacher education, curriculum development, and evaluation of vocational education programs. Thus, considerable shift in research priorities for vocational education, at least as far as the respondents in this study are concerned, seems to be occurring.

To answer the second question requires a topic-by-topic comparison between the five new topics for vocational education research identified by David and by Phelps and Hughes and the six topics and statements that comprise each from this study. The comparison follows.

- o Impact of Future Workplace and Societal Changes on Vocational Education. This topic is supported by the 11 statements of the subtopic "Workforce/Workplace Changes Related to Changing Technology, Changing Demographics, and a World-Wide Economy" (Table 3). This category has most likely evolved from the "Labor Market Supply and Demand" topic identified by COVERD in that 3 of the 10 statements support this topic. Information and Knowledge for Policy Making. The 26 statements in the topical area related to policy studies (Table 3) may be classified as supporting this topic. However, the 11 statements just discussed as supporting the "Impact of Future Workplace and Societal Changes" have now been combined into this one topic. Excluding these 11 statements, the remaining 15 statements still indicate extensive support for this topic. They are divided among three subtopics: "Clarifying the Role of Vocational Education," with 6 statements; "The Federal Role in Vocational Education," with 6 statements; and "Vocational Education's Role in Economic Development," with 3 statements.
- o Basic Skills Development Through Vocational Education. Identified as a separate topical area in this study, needed research related to basic skills development in vocational education (Table 5) has 15 statements indicating extensive support for the topic. The statements are divided between



two subtopics: "Identifying Basic Skills/Core Competencies," with 8 statements. and "Teaching, Assessing, and Documenting Basic Skills," with 7 statements.

- o Access and Equity Issues. Although identified as a new topic, "Access and Equity Issues" has probably evolved from other topics. As Phelps and Hughes (1986, p. 62) noted, it is related to recruitment, guidance and counseling. Thus, it is most likely based in the topic of "Career Development and Guidance" identified by COVERD. In this study, statements supporting it have been placed in the subtopic of "Delivering Instruction to Students with Special Needs" (Table 2). The term "access" or terms relating to "sex equity" occur in 6 of the 14 statements in the subtopic.
- o Interrelationships Between Family and Work. None of the 122 statements support the topic of conducting research related to concerns about interrelationships between family and work, at least within the context of vocational education.

When the same criteria of support from statements in this study are applied to the five new topics as were applied to the original nine topics, three are classified as having "extensive support," one as having "moderate support," and one as having "limited or no support." The three with extensive support are "Impact of Future Workplace and Societal Changes on Vocational Education," "Information and Knowledge for Policy Making," and "Basic Skills Development through Vocational Education." The one with moderate support is

"Access and Equity"; the one with limited support is

"Interrelationships Between Family and Work."

The third question, regarding what new topics for vocational education research have emerged from the 122 statements of this study, is the least complicated of the three questions to answer. The new topics are found in two areas, research related to policy studies (Table 3) and research related to collaborative relationships (Table 6). The new areas for vocational education research, along with the number of statements supporting them, are as follows:

"Clarifying the Role of Vocational Education and the Federal Role in Vocational Education" (12 statements) and "Collaborative Relationships in Vocational Education" (14 statements). The first topic is a combination of two subtopics classified under the topical area of policy studies. The second topic is the 14 statements of the topical area on collaborative relationships.

In summary, then, a listing of prioritized research topics based on the analysis of historical and current vocational education scholars, commingled with current research efforts, and further based on futuristic assessment by current vocational education research organizations, seems imperative for setting the future research agenda for a national center for research in vocational education. The following eight topics, listed according to priority as established in this study, are proposed for the primary research foci for such a center:

1. Effectiveness (or evaluation) of vocational education

2. Vocational program development and improvement,  
including curriculum development
3. Basic skills development in vocational education
4. Policy studies in vocational education, including the  
impact of future workplace and societal changes in  
vocational education
5. Collaborative relationship development in vocational  
education
6. Vocational personnel development
7. Providing for students with special needs, including  
addressing issues of access and equity
8. Clarifying the role of vocational education and the  
Federal role in vocational education

The priorities for needed research that have emerged in this study naturally reflect the biases of the respondent group--current major providers of educational research and development--based on their historic and present sense of the research needs in vocational education. It is conceivable, of course, that the priorities, although based on and considerably modified from previously identified priorities for vocational education research, are not the appropriate ones. Cakes (1986), in critiquing research in vocational education, suggests that a basic problem is that the research ignores issues fundamental to vocational education--issues such as whose interests are really served by vocational education and what do students really gain by participating in vocational education. Yet

the interrelationship between the eight major priorities identified in this study and priorities previously enumerated lends credence to their merit. Further, the new priorities that have emerged do in fact "make sense," a sound argument for their existence.

## REFERENCES

- David, H. (1983). A summing up. In H. David, H. F. Hjelm, & R. C. Harris (Eds.), Vocational education research in the 1980s (pp. 140-146). Bloomington, IN: American Vocational Education Research Association in cooperation with the Indiana University Publication Office.
- Evans, R. N. (1983). Research suggestions from the report of the committee on vocational education research and development. In H. David, H. F. Hjelm, & R. C. Harris (Eds.), Vocational education research in the 1980s (pp. 2-9). Bloomington, IN: American Vocational Education Research Association in cooperation with the Indiana University Publication Office.
- Hjelm, H. F. (1983). Preface. In H. David, H. F. Hjelm, & R. C. Harris (Eds.), Vocational education research in the 1980s (pp. iii-iv). Bloomington, IN: American Vocational Education Research Association in cooperation with the Indiana University Publication Office.
- National Commission on Secondary Vocational Education. (1984). The unfinished agenda, the role of vocational education in the high school. Columbus: The National Center for Research in Vocational Education, The Ohio State University.
- Oakes, J. (1986). Beneath the bottom line: A critique of vocational education research. Journal of Vocational Education Research, 11(2), 33-50.
- Phelps, A. L., & Hughes, R. P. (1986). The unfinished agenda: Some implications for research in secondary vocational education. Journal of Vocational Education Research, 11(2), 51-72.

APPENDIX A

MISSION/PURPOSES OF RESPONDING MAJOR VOCATIONAL  
EDUCATION RESEARCH PROVIDING ORGANIZATIONS

ORGANIZATION	MISSION/PURPOSES
American Association for Vocational Instructional Materials	The purposes of this nonprofit association are to development and distribute vocational training materials.
American Institutes for Research	AIP is an independent not-for-profit corporation established in 1946. Research, development, and evaluation services are provided to Federal, state, and local government agencies; to foundations and public service associations; and to industrial clients.
Appalachia Educational Laboratory, Inc.	AEL's purpose is to work with the region's educators in an ongoing research and development-based effort to improve education and educational opportunity.
The Center for Occupa- tional Research and Development	CORD is a nonprofit public service organization dedicated to the advancement of vocational and technical education. Spanning both secondary and postsecondary education, CORD delivers effective strategies and materials that promote a more productive and competitive workforce.
Correctional Education Association	The Association, founded in 1946, is a nonprofit, professional association serving educators and administrators who provide services to students in correctional settings.
East Central Curriculum Coordinating Center	The purposes of the Network include providing providing assistance in vocational curriculum design, development, and dissemination; evaluating effectiveness of educational programs and projects; providing training in educational planning, management, evaluation, and instruction; and serving as an information resource on effective educational programs and processes, including networking among educational agencies, institutions, and individuals in the region.
Future Business Leaders of America-Phi Beta Lambda, Inc.	FBLA-PBL is a national association of intermediate, high school, vocational school, junior college, college, and university students interested in business education careers. Intermediate and secondary business students are FBLA members. Postsecondary and

## ORGANIZATION

## MISSION/PURPOSES

Future Homemakers of  
America, Inc.

college level business students are Phi Beta Lambda members. Former FBLA and PBL members comprise the alumni division.

The goal of FHA is to help youth assume their roles in society through home economics education in areas of personal growth, family life, vocational preparation, and community involvement. Organized instruction relating to the goal is a part of the home economics program in the school.

Maryland State  
Department of Education,  
Division of Vocational-  
Technical Education

This state agency is responsible for administering, developing, monitoring, and evaluating vocational-technical education in Maryland. Programs are offered in both private and public institutions and are available to school-age and adult citizens.

Mid-Atlantic Center for  
Sex Equity

The Center's goal is to help public schools meet the requirements of Title IX and achieve sex equity in educational programs and activities and in employment.

Mid-America Vocational  
Curriculum Consortium

MAVCC is an organization of eleven states that develops mutually needed, competency-based instructional materials through a joint effort and is funded through membership fees, the sale of materials, and outside sources.

National Association of  
Housing and Redevelop-  
ment Officials

The mission of the Professional Development Division of the Association is to provide job-related training to rental housing managers.

National Child Labor  
Committee

The purpose of the Committee is to improve educational and employment opportunities for young people.

National Council on  
Vocational Education

The purpose of the Council is to advise the President of the United States, Congress, and the Secretary and Assistant Secretary of Education on issues regarding vocational education.

National Institute for  
Work and Learning

NIWL, a private, tax exempt, not-for-profit corporation, seeks to improve the relationships between institutions of work and learning, to facilitate linkages between



## ORGANIZATION

## MISSION/PURPOSES

education and work for youth and adults, and to bring the supply of and demand for critical skills into better balance.

National Occupational  
Information Coordinating  
Committee

NOICC's mission is to foster coordination and communication among users and producers of occupational information and to promote the use of such information. The principal objectives are to assist states in the development and implementation of an occupational information system for vocational and job training planners and administrators; and to assist states in meeting the labor market information needs of youth and adults, including delivery of career information for career exploration.

Northeast Curriculum  
Coordinating Center

The Center's purpose is to reduce the duplication of effort in curriculum development by serving as an information dissemination agency and clearinghouse for vocational-technical curricula.

Northeast-Midwest  
Institute

The Institute conducts policy research and analysis on issues of economic development, human resources, energy, and environment of concern to members of Congress and states in the Northeast-Midwest region.

Northwest Curriculum  
Coordination Center

The Center's purpose is to provide leadership for curriculum coordination in a ten-state region.

Northwest Regional  
Educational Laboratory

The Laboratory assists education, government, community agencies, business, and labor in improving the quality and equality of educational programs and processes by developing and disseminating effective educational products and procedures; conducting research on educational needs and problems; providing technical assistance in educational problem solving; evaluating effectiveness of educational programs and projects; providing training in educational planning, management, evaluation, and instruction; and serving as an information resource on effective educational programs and processes, including networking among educational agencies, institutions, and individuals in the region.

## ORGANIZATION

## MISSION/PURPOSES

Research for Better  
Schools, Inc.

This organization serves as the U.S. Department of Education's regional educational laboratory for the Mid-Atlantic Region.

Southern Growth  
Policies Board

The Board is a public, interstate agency governed and supported by the state and local governments of the Southern United States and Puerto Rico. It represents a regional commitment to excellence; a cooperative effort to develop, conserve, and put to best use the South's natural and human resources. In order to enhance the region's decision-making processes, the Board assembles objective information and makes recommendations regarding economic development opportunities in the South.

University Council for  
Vocational Education

The Council's purposes include providing a forum in which universities can participate in studying and improving the role of vocational education; providing a voice for universities regarding trends and issues in undergraduate and graduate education, research, and extension in vocational education; and contributing to the development, application, and evaluation of new knowledge in vocational education.

W. E. Upjohn Institute

The Institute's charter established the basis for a forward-looking research tradition, designed to seek workable solutions to problems of employment and unemployment. The charter instructs the Institute to conduct "research into the causes and effects of unemployment and devise ways and means of preventing and alleviating the distress and hardship caused by unemployment; to create, experiment with, and put into effect any plan or device that the Board of Trustees may determine feasible to accomplish that purpose . . ."

Western Curriculum  
Coordination Center

The overall goal of the WCCC Coordination Center is to provide leadership for vocational education curriculum coordination to the eight states and territories of the

## ORGANIZATION

## MISSION/PURPOSES

The Vocational Studies  
Center, University of  
Wisconsin-Madison

Western region. The objectives are to coordinate curriculum development and dissemination activities through participation in the National Network for Curriculum Coordination in Vocational-Technical Education, and to establish and maintain a Curriculum Coordination Center for a regional consortium of the eight Western states and territories.

The Center is a research, development, and service organization that attempts to meet needs identified by vocational education in Wisconsin and in the nation. The center operates as a nonacademic unit within the School of Education. It is self-supporting through contracts and grants secured from local, state, and national sources.

Vocational-Technical  
Education Consortium  
of States

The purpose of V-TECS is to promote the systematic development and implementation of the concept of competency-based vocational-technical education. Consortium activities include securing the active participation of state vocational-technical education agencies and other appropriate organizations in cooperative research and development efforts which concentrate on, but are not limited to, the analysis of jobs and the organization of job-related information; developing vehicles for assessing student achievement; and developing and/or acquisitioning instructional materials that provide a validated link between education and employment.

Women's Bureau

The Bureau is the only federal agency devoted to women's issues. Its purposes are "to formulate standards and policies which shall promote the welfare of wage-earning women, improve their working conditions, increase their efficiency, and advance their opportunities for profitable employment" Public Law No. 259, 66th Congress (H.R. 13229). Approved June 5, 1920.

APPENDIX B

STATUS OF EXISTING RESEARCH/DEVELOPMENT OF RESPONDING  
MAJOR VOCATIONAL EDUCATION RESEARCH PROVIDING ORGANIZATIONS

## ORGANIZATION

## STATUS OF EXISTING RESEARCH/DEVELOPMENT

American Association  
for Vocational  
Instruction Materials

Presently preparing texts on carpentry,  
plumbing, diesel engines, applying  
pesticides, home electrical repair, etc.

Planning items on software and nuclear  
energy in the areas of surveying and  
electric motor controls

Recently published vocational student  
advisor's handbook

American Institute for  
Research

Conducted a three-year project to  
develop, field-test, and disseminate  
competency measures for 17 vocational  
skill areas. Products included 17  
Competency Measures Tests  
(paper-and-pencil, performance, and  
affective components); 4 handbooks on the  
design, effective use, and evaluation of  
vocational competency measures; OMB  
Clearance Package

Civilian Occupational Validation of  
ASVAB: The primary objective of this  
current project is to collect and  
common civilian jobs in order to increase  
the usefulness of ASVAB for students,  
counselors, and schools.

Study of Industry-Education-Labor  
Collaboration for Occupational Education;  
includes examining the impact of  
Industry-Education-Labor Councils on  
vocational education, working with  
constituent groups (e.g., PIC; CETA),  
and preparing cohesive reports and case  
studies

Assisted the National Institute for Work  
and Learning in assessing the impact of  
Industry-Education-Labor (I-E-L) Councils.

Appalachia Educational  
Laboratory, Inc.

AEL is directed toward general education  
at the elementary and secondary school level;  
therefore, the Laboratory is not involved  
directly in research on vocational education.

## ORGANIZATION

## STATUS OF EXISTING RESEARCH/DEVELOPMENT

The Center for Occupational Research and Development

Identify and design technical curricula for new and emerging technologies: Biotechnology, Intelligent Building Management/Maintenance, Precision

Develop models and implementation strategies for 2 + 2 (secondary/postsecondary) articulation

"Transformations at Copperhill" represents a working curriculum for retraining displaced workers. It needs to be evaluated, revised, and broadly disseminated

Principles of Technology is developed and working. Applied Mathematics and Applied Communications are being developed. Development of Applied Biology/Chemistry will begin this year.

Correctional Education Association

Sponsoring National Institute of Corrections grant to develop guide for computer programs in corrections

East Central Curriculum Coordinating Center

Check list for quality curriculum for developers

Check list for quality curriculum for users

Standard Format for curriculum in East Central region

Three-part series on state technical committees

Study of curriculum consortia (in progress)

Study of various curriculum development techniques (in progress)

Future Business Leaders of America-Phi Beta Lambda, Inc.

Conducting current research related to "business employers' perception of acceptable individual traits of employed students relative to FBLA goals"

## ORGANIZATION

Future Homemakers of  
America, Inc.

## STATUS OF EXISTING RESEARCH/DEVELOPMENT

Through the years research findings have helped advance the knowledge base about the organization and answer questions about:

Benefits of belonging to Future Homemakers of America

Perceived benefits and attitudes of advisers

Leadership development activities

Factors contributing to chapter success

The value of integrating chapter activities with the curriculum and the extent to which this integration occurs

Adviser preparation

The extent to which chapter activities coincide with the organization's stated purposes

The effectiveness of specific programs

Member characteristics

Maryland State  
Department of Education  
Division of Vocational-  
Technical Education

Examining the condition of vocational education in approved programs throughout the state.

Report on the Condition of Vocational Education. The data indicate that Maryland's vocational-technical education programs are preparing graduates with skills needed for entry-level jobs. That is, from both students and employers, reactions were overwhelmingly favorable.

Mid-Atlantic Center for  
Sex Equity

Report Card #2: Sex Bias in Colleges and Universities. Summarizes research on faculty, students, curriculum, and instruction and draws a profile of what is happening to women in colleges and universities

Report Card #4: Sex Bias in Educational Administration. Summarizing current research, this report graphically

## ORGANIZATION

## STATUS OF EXISTING RESEARCH/DEVELOPMENT

displays the decline of women as educational leaders. It also presents a profile of the "typical" female administrator, studies of administrator effectiveness, and the barriers faced by women in administration.

-Report Card #5: Education and the Teenage Pregnancy Puzzle. What societal factors contribute to teenage pregnancy? Who is at risk, and what are the costs? The pamphlet addresses these questions and explores the school's role in helping teenage parents continue their education.

Report Card #6: Gifted Girls--The Disappearing Act. This report provides research findings and practical strategies to identifying and teaching gifted young women.

Mid-America Vocational  
Curriculum Consortium

Has developed more than 75 different competency-based publications

Continuing development of duties and tasks by occupational areas

National Association of  
Housing and Redevelop-  
ment Officials

No Response

National Child Labor  
Committee

Setting up a network of state departments of education that will coordinate their research activities with respect to transition to work. Seven states have agreed to participate, and a number of others have indicated their interest but are unable to participate now.

National Council on  
Vocational Education

Implementing Project Catalyst, which addresses the questions of improving the public presence of vocational education and highlighting the goals of the Carl Perkins Act. The Council will work toward the goals of ensuring that vocational education is aligned with the demands of the future.



## ORGANIZATION

## STATUS OF EXISTING RESEARCH/DEVELOPMENT

National Institute for  
Work and Learning

Prepared for the National Academy of Sciences a chapter entitled "New Office and Business Technologies: The Structure of Education and (Re)Training Opportunities." The chapter will be included in Computer Chips and Paper Clips: Technology and Women's Employment, Volume II, Case Studies and Policy Perspectives, National Research Council, National Academy Press, to be published in 1987.

National Occupational  
Information Coordinating  
Committee

Initiated major efforts to support the preparation of occupational projections in the states, including:

Development of an exportable microcomputer matrix system for developing state occupational employment projections.

Preparation of an industry and occupational employment projections handbook and training program. New state occupation-specific labor force separation rates were completed and are used in estimating job openings due to replacement needs.

Northeast Curriculum  
Coordinating Center

Primary purpose is dissemination (some technical assistance activities); does not conduct original research.

Northeast-Midwest  
Institute

No response

Northwest Curriculum  
Coordinating Center

No Response

Northwest Regional  
Education Laboratory

Oregon secondary school and community college vocational educators are working collaboratively to promote regional planning and program development.

Washington is looking closely at program revision in the trade and industrial (T&I) areas. The outcome may include recommendations for program improvement ranging from middle/junior high

## ORGANIZATION

## STATUS OF EXISTING RESEARCH/DEVELOPMENT

orientation and exploration to postsecondary specialization.

Three service districts in Oregon have gained national attention for their collaborative project, which includes both print and computer-based outcome statements for curriculum planning.

Equivalent credit as an approach to integration is the focus of a project funded by the Commission for Vocational Education in Washington using JTPA resources.

Encouraging four separate high schools to develop the model that will work best in their school to more closely relate academic and vocational coursework is the focus of a Portland project using Chapter II Federal funds

Continuing a series of projects within Oregon to analyze what happens to completers of community college vocational programs after they have left school to enter employment or other career pathways

Identifying and updating an information base and peer assistance network to assist linkages and convene key personnel in both public and private sectors for dialogues on topics of mutual concern

Identifying, monitoring, synthesizing, and disseminating findings affecting education and employment to local, state, and regional leaders to assist with policymaking

Researching exemplary vocational education practices in effective schooling, developing "how to" guides for teachers on researched concepts, and disseminating findings through conferences, workshops, and publications

## ORGANIZATION

## STATUS OF EXISTING RESEARCH/DEVELOPMENT

On-site coordination to monitor the research design for a national demonstration of the Summer Training and Education Program (STEP). STEP incorporates basic skills remediation with summer work experience  
 Identifying important upcoming trends for the Northwest and Pacific rim economies, examining what schools are now doing to address technological literacy requirements, and reporting curriculum needs in this area

A human resources development firm was awarded a demonstration grant from the U.S. Department of Education's Special Education Branch to develop private sector linkages aimed at reinforcing employability skills of handicapped youth. NWREL will be providing assistance in the design and evaluation phases of this multi-year project

Providing technical assistance in curriculum development, assessment, and evaluation to the Idaho Division of Vocational Education--acting in its role as agency responsible for coordination between education and JTPA programs in the state.

Preparing Young Women for Work. This project addresses the need for active and field sites.

Long-Range Planning in Career and Vocational Education. Several Northwest education agencies have contracted with planning.

Skills Required by the Automated Office. The Office of Technology Assessment requested NWREL to prepare a draft policy issue paper based on discussions with selected private and public sector "information-oriented" workers.

Status of Vocational Education in Portland Public Schools. An intensive review of vocational education programs in the

## ORGANIZATION

## STATUS OF EXISTING RESEARCH/DEVELOPMENT

District to determine how effective they are in light of changes in the workplace, both now and in the future.

Career Redirections for Adults. A 198-page workshop handbook developed by the Education and Work Program at NWREL.

Ideabook on Occupational Information for Disadvantaged Youth. The Ideabook presents ways for community-based organizations to improve delivery of career information to out-of-school youth.

"Literature Review on Improving Secondary Vocational Education Effectiveness,  
March 1986.

Partners for Youth Employability: An Ideabook for Educators and Employers,  
ERIC # ED 234-270 (limited copies available).

"New Directions in Vocational Education: The New York Approach." This videocassette describes New York's "futuring" process, which resulted in revised occupational education programs. (Free loan)

"Selected References on Worker Dislocation and the Unemployment Process: An Annotated Bibliography"  
September 1985

Research for Better  
Schools, Inc.

"The Impact of High School Vocational Education: A Review with Recommendations for Improvement." About half of all youth either do not complete high school or end their formal education with the high school diploma. What forms of occupationally specific education and training, if any, should the public schools offer these youth? To inform this debate, John Bishop of the New York State School of Industrial and Labor Relations is conducting a review of the research on vocational education.

Southern Growth  
Policies Board

Analyzing employment patterns between 1977 and 1984 in the South, which

## ORGANIZATION

## STATUS OF EXISTING RESEARCH/DEVELOPMENT

will include the effects of the availability of vocational education (number of programs per county)

University Council for Vocational Education      Examining teacher education among member institutions

   Sponsoring Visiting Scholar program and Distinguished Young Scholar program.

W. E. Upjohn Institute      Recently completed projects include:

   National Commission for Employment Policy  
--Clerical Employment and Technological Change, February 1986

   National Academy of Sciences, Panel on Technology and Employment--Labor Market Adjustment, October 1986

   Business Tax Cost Study, 1987

   Costs and Benefits of Unemployment Insurance in Michigan Relative to Selected Other States, 1986

   Examining the Consequences of Job Loss and the Effects of Structural Change on Employment Using a Large Micro-Data Base Derived from Pennsylvania UI Records

   Analysis of Policies to Assist Dislocated Workers, National Council on Employment Policy (NCEP); The National Academy of Sciences (NAS) Panel on Employment and Technology

   Illinois Unemployment Insurance Bonus Experiment

Western Curriculum Coordination Center      No Response

The Vocational Studies Center, University of Wisconsin-Madison      Research conducted is applied research. Extensive publications on this research are developed at the conclusion of or during project operation. Projects include:

   A series of workshops and a handbook on Helping Handicapped Students Become

## ORGANIZATION

## STATUS OF EXISTING RESEARCH/DEVELOPMENT

a Part of the Job Training Partnership Act

A New Comprehensive Catalog of Tools, Equipment & Machinery for handicapped people

Better Than I Thought!--eight filmstrips preparing vocational teachers to meet the needs of handicapped students

Whatever It Takes to Help Students Learn and Become Employable--a series of three filmstrips

A Handbook on Modifying Vocational Curricula for Handicapped Students.

Effective Microcomputer-Assisted Instruction for the Vocational Education of Special-Needs Students

Replicating Jobs in Business & Industry for Persons With Disabilities; Job Replication Form. The purpose of the Job Replication Form is to obtain information about jobs persons with disabilities perform in business and industry and in the public sector Strategies for Developing a Coordinated Vocational Assessment Process for Youth--a Compilation of Ideas and Resources for the Service Delivery Areas Under the Job Training Partnership Act

Models for Linking Agencies--Planning for the Future is an Empty Exercise if Cooperation Cannot Be Achieved

Computer-Assisted Instruction--conducting a national search for successful microcomputer assisted instruction for use in the improvement of secondary and postsecondary vocational education programs

Replicating Jobs in Business and Industry for Persons with Disabilities. Two

## ORGANIZATION

## STATUS OF EXISTING RESEARCH/DEVELOPMENT

manuals to assist in the replication of jobs performed by persons with disabilities in business and industry are now available.

Successful Vocational Rehabilitation of Persons with Learning Disabilities

Profiles of Success--serving secondary special education students through the Carl D. Perkins Vocational Education Act

Vocational-Technical Education Consortium of States

The Consortium specializes in the development of competency-based vocational-technical education materials. Materials currently available for specific occupational areas include:

- 117 Catalogs of Performance Objectives and Performance Guides
- 23 Curriculum Guides
- 15 Test Item Books

Under Development are:

- 10 Revised Catalogs
- 5 New Catalogs
- 24 Curriculum Guides
- 11 Test Item Books

Women's Bureau

Sponsor of National Academy of Science, National Research Council's preparation of Computer Chips and Paper Clips--Technology and Women's Employment (2 volumes). The basis of the publication is that the context of jobs is changing to incorporate new office technology. The newer, more highly skilled office clerical worker will interface with the technology and the public, with a number clerical jobs rolled into one super job.

A SUMMARY OF TRENDS AND ISSUES  
WITH IMPLICATIONS FOR RESEARCH AND  
DEVELOPMENT IN VOCATIONAL EDUCATION

Prepared by Faculty and Staff in the  
Division of Vocational and Technical Education  
Virginia Polytechnic Institute and State University  
Blacksburg, Virginia 24061

May, 1987



## Foreword

Section 404 of the Carl D. Perkins Vocational Education Act, 20 U.S.C. 2404, authorizes the Secretary of Education to designate, on the basis of solicited applications, a National Center for Research in Vocational Education once every five years. The Perkins Act redirects and expands the research objectives and activities of the new National Center, which will begin its first full five-year funding cycle under this Act in January of 1988. The mission of the National Center, as specified by Congress in the Perkins Act, includes: (1) conducting applied research and development, (2) providing leadership development, (3) disseminating the results of research, (4) providing information to facilitate national planning, (5) providing technical assistance, (6) acting as a clearinghouse, (7) working with the states in developing methods of planning and evaluating programs, and (8) reporting annually to Congress regarding coordination under this act and the Job Training Partnership Act (JTPA).

The Office of Vocational and Adult Education in the U. S. Department of Education awarded a planning grant to the Division of Vocational and Technical Education at Virginia Tech to support competition for a new five-year cycle of the National Center. This document was prepared as one activity of this planning grant. However, the contents of this publication do not necessarily represent the policy of the Department of Education, and the reader should not assume endorsement by the Federal Government.

This publication should be viewed by its readers as an attempt to describe succinctly the vocational education enterprise as it currently exists in the United States. Significant societal, economic, technological, and related demographic characteristics impacting on vocational education are presented. Vocational education issues that have implications for research are highlighted. Finally, an initial listing of recommendations for research in vocational is presented.

This paper can serve as one contextual source of information for participants in focus group interviews as they assist the planning grant project team in setting vocational education research and development priorities for the next five years. Other informational sources will include, of course, the participants' good thinking, experiences, vision, and professional viewpoint relative to future research and development in vocational education.

The members of project staff are appreciative of the nearly fifty agencies that provided information, which, when compiled into a very lengthy paper, served as the major source for this highly synthesized document. Acknowledgment is made to the following persons who assisted in compiling the major paper and this synthesized version: Dr. Nevin Frantz, Jr., Ms. Shirley Hall, Dr. Richard L. Lynch, Dr. Marion Asche, Dr. Susan Asselin, Dr. Penny Burge, Mr. Steve Culver, Ms. Sharon Dwyer, Dr. Curtis Finch, Dr. James Hoerner, Dr. Margaret Kirby, Dr. Carl McDaniels, Dr. John McLaughlin, Dr. Dale Oliver, Dr. June Schmidt, Mr. James Smith, and Dr. Deborah Strickland.

## Vocational Education: Description and Outcomes

Vocational education in the United States is an extraordinarily diverse enterprise. Starting in junior high school and continuing through college and on to a wide variety of adult programs, offerings range from typing and home economics classes to highly technical courses in electronics, inhalation therapy, and medical technology. At some point during secondary or postsecondary education, almost every American takes some vocational education. America spends well over \$15 billion annually on vocational education in a loosely federated network of junior and senior public high schools, area vocational schools, community colleges, technical institutes, proprietary schools, prisons, and four-year colleges and universities. In short, vocational education is a large, complex component of the nation's education system.

Programs offered through vocational education are often classified into two broad categories: general vocational education and occupational vocational education. General vocational education includes such programs as consumer and homemaking, middle school/career exploration programs, prevocational basic skills programs, and employability skills programs. Occupational vocational education includes over 400 occupational-cluster, occupational-specific, or job-specific programs categorized into one of the following areas: (a) agriculture, (b) marketing, (c) health, (d) occupational home economics, (e) business and office occupations, (f) technical, and (g) trade and industry.

In some respects, the very size and diversity of the enterprise is testimony to its importance and popularity. From 1960 to 1980, vocational

education in the public schools experienced spectacular growth. Although the data are rough, enrollment in secondary and postsecondary vocational education programs increased from about 4 million students in the early 1960s to around 17 million by 1980. This enrollment is almost evenly divided between male and female students (although enrollments vary greatly by sex in many program areas). Minority students represent about 24% of the total enrollment. About 60% of the students enrolled in public vocational education are enrolled in secondary programs. In 1982, about 95% of all public high school graduates had earned some credit in vocational courses.

In 1964, the Federal Government spent \$55 million and state and local governments \$278 million on vocational education; by 1981 these figures had risen to about \$750 million and \$6.7 billion respectively. With the possible exception of the community college system, no other segment of American education can claim a higher rate of growth over the last two-and-a-half decades; and much of the community college expansion is attributable, of course, to vocational education.

In addition to its size and recent growth, the vocational education system can boast of many successes. All around the country, there are rigorous and demanding secondary and postsecondary programs preparing students for current and future employment. There are exemplary new programs that increase access to employment for handicapped individuals. In many comprehensive high schools, vocational classes provide a motivation to finish high school for students who are not interested in college or in conventional academic classes. Vocational student organizations create an arena for achievement that helps preserve our

pluralistic conception of excellence. Consumer and homemaking classes provide important instruction in child rearing, effective consumer habits, and basic nutrition. Vocational electives targeted to college-bound students are offered. With assistance from state economic development programs, many area vocational schools and postsecondary institutions have developed customized training programs to help in attracting new businesses to their communities.

Despite these successes, vocational education--especially at the secondary level--recently has come in for harsh criticism by a number of different and highly respected sources, such as the Committee for Economic Development and the National Academy of Sciences. It has often been a challenge to explain or defend vocational education, primarily because of the heterogeneous programming at secondary, postsecondary, and adult levels and objectives that shift in relation to the particular student, level at which course work is taken, needs of the labor market, legislated policy, type of institution, and geographic region. Thus, studies examining the outcomes of vocational education that have focused on rather narrow economic or "cost-benefit" variables have produced mixed results. An additional outcomes-related factor that should be considered is student participation, which includes enrollment in different types of vocational education programs, participation at different points in one's lifetime, and the actual amount of participation or concentration. Students can no longer be classified as strictly "vocational," "academic," or "general"; their reasons for enrolling in a particular vocational, academic, or general program--or any combination thereof--are as diverse as the students themselves and their educational objectives.

Research findings related to vocational education outcomes are fairly consistent at some levels, particularly at the secondary level. There are several trends favoring vocational education as a meaningful experience in terms of payoff for program graduates. At the secondary level, vocational education appears to attract students with similar values and attitudes, provide specific job preparation, and retain students who might otherwise drop out of high school. Vocational education has been shown to benefit graduates in terms of more continuous employment, economic benefits, productivity, and job satisfaction. Postsecondary (e.g., junior or community colleges and technical institutes) vocational graduates, in general, experience greater economic success with more satisfactory employment and better earnings than graduates of other curricula in similar institutions.

The National Council for Vocational Education recommended that several areas receive greater emphasis in the years to come. Vocational education programs must be responsive to students' diverse needs, as well as the challenges of productivity and technological change. Students must acquire basic skills and develop an understanding of the work ethic and acquire a commitment to it. Programming must include entrepreneurship education and access to lifelong learning. Partnerships must be fostered among education, business, industry, labor, and government. Advisory councils, vocational student organizations, and job placement services are key aspects of such partnerships.

#### Societal Characteristics and Trends

The current population of the United States is about 240 million. During the 1980s the population is expected to increase about 0.9% per

year, and the growth rate is expected to slow to about 0.67% per year near the end of this century. The population is growing older, and early in the next century a third of the nation will be over age 50 as compared to about 25% now. The number of 14- to 24-year-olds is expected to decline from 25% of the total population to 16% by 1995. Today the population is about 17% nonwhite; by around the year 2000, one of three Americans will be nonwhite.

The U.S. labor force has been increasing and is now about 113 million with an unemployment rate of about 7%. Over two-thirds of the workers are employed in service-producing industries and less than one-third in goods-producing industries. During the late 1970s and early 1980s, 20 million new jobs were created; only 5% of these were in manufacturing. The United States is expected to gain 43 million new jobs by the year 2010, primarily in the service/information-oriented occupations. Women will account for two-thirds of the labor force growth during the 1980s and 1990s; in the future blacks and other minorities will account for a greater proportion of overall labor force growth than in the past, and there will be more handicapped in the mainstream of the work force. With so many present workers expected to remain in the work force through the 1990s, continued education and training must be viewed as a lifelong process. Business, public training institutions, school systems, private training institutions, and labor must work in partnership to ensure minimal duplication in the provision of training.

Family life in America is undergoing several changes. One of the most profound of these changes has been the transformation of America into a land of working mothers. About 40 years ago, fewer than one out of five

married women with children worked outside the home; in 1986, more than three of every five earned a paycheck. The number of "latch-key children," those who are at home after school when adults are not present, has shown a major increase and will continue to do so.

Although the living standards continue to advance in the United States, there are stubborn pockets of economic distress. By the early 1960s, about one in five Americans was poor; today about one in seven lives in poverty. Recently there has been a sharp rise in the number of poor families headed by women. Women and children account for a distressingly large number of the nation's poor. While poverty is pervasive among women and children, those with little schooling, and blacks, two-thirds of all the nation's poor are white, the majority are adults, and half of all poor families are headed by men.

The percentage of births to unwed adolescent mothers has almost quadrupled in the past 30 years. Nearly half of all black females are pregnant by age 20, and white teen pregnancy rates are also soaring. Half of these teenage mothers will never complete high school. The large numbers of prime-age female workers will require increased child care facilities, new or more flexible benefit packages, and greater flexibility in working hours.

With regard to education, in 1985 there were more children attending preprimary school than ever before, including 2.5 million total in nursery school and 3.8 million in kindergarten. Over the next several years there will be increases in elementary and secondary enrollments as these children move through the system. Experts predict the number of high

school dropouts will increase; however, there is considerable promise in drop out prevention programs.

Over the past several years, numerous reports have been published that contain recommendations for reforming education. As the system is reformed, care must be taken not to push low-income or disadvantaged persons out of these improved learning systems. This is important for both equity and economic reasons: equity, because there will not be a stable society without major attention to a more equitable sharing of the benefits and costs of change; economic, because all of the net labor force growth over the next three decades will be minorities and women. It is probable that more people in the future than in the past will continue to acquire more schooling. Education is still the primary American way of achieving upward mobility.

#### Economic Trends

According to the 1984 Occupational Outlook Handbook, about 75% of occupations in the United States are in service-producing industries. This information supports John Naisbitt's conclusion in Megatrends that America has moved from being primarily an industrial society to being primarily a service/information-oriented/high technology society.

A major force in these shifts has been the application of technology to farming and industry. Another significant factor in the last 25 years has been the increasing involvement in the global economy. International trade has grown from 10% of the gross national product in 1960 to 20% in the mid-1980s.

The increasing involvement in international trade has a significant impact upon the U.S. economy. The agricultural industry provides a



dramatic illustration of this impact. During the 1970s, major growth and expansion in production agriculture occurred in response to an increasing export demand for U.S. agricultural products. Unfortunately, domestic and international economic conditions changed in the 1980s and drastically reduced the export demand for the products. The decline in exports is a major cause of the depressed economic condition today in the farm sector.

A serious problem facing the United States in the international economy is the loss of competitiveness of much of the nation's industry. The best indicators of this competitiveness problem are the loss of market share (absolute and across industries), the declining profitability of industries, and the declining real wage for workers. These losses have resulted in declining family incomes, growing trade deficits, and rising external debt. The external problems are complicated by the chronic deficits in the federal budget. If the United States wishes to maintain or improve the high real wages of workers, there must be heavy emphasis on technological innovation and human resource development. Studies by economists have consistently found that knowledge, technology, and improvement in the quality of human resources have been responsible for an overwhelming share of improvements in productivity and most of the growth in national income.

Greater emphasis on human resource development will require improvement in vocational education. Reform must start by attracting and retaining highly qualified and better-paid teachers, motivating students, maintaining vigorous standards, and combining academic subjects with education on up-to-date equipment. There must be closer interaction between education and industry, including the involvement of teachers and

students in private sector research and development activities. A major requirement for upgrading vocational education is more research and evaluation with respect to the programs. These activities could improve the status of teachers and the quality of vocational learning experiences. The involvement of industry leaders in education programs could strengthen education, as well as overcome the biases that industry leaders and educators have toward each other.

### Technological Change

Although the impact of technological developments on society and vocational education is widely discussed, it is not easily understood. Through the application of new technologies, new industries have been created and some old industries have been revived. New jobs have been created, many jobs have changed, and others have been made obsolete. These trends indicate that most jobs will be influenced by new and emerging technologies.

What will be the impact of high technology on the work world over the next several years? In terms of employment expansion, high-technology industries are expected to provide only a small portion of the jobs created between 1982 and 1995. Instead, most of the jobs created will be in the traditional lines of occupations. High technology is being introduced into these occupations, and it does affect the nature of how the work is carried out. The introduction of high technology offers greater mobility for workers across industries, reduces the number of natural career ladders, and causes more jobs to be decentralized (e.g., located outside major population concentrations).

It is important that high technology, especially in the form of computer skills, be integrated into vocational education curricula. The effectiveness of introducing computers into schools is largely determined by the presence of three conditions: (a) good advance planning, (b) teacher education, and (c) high-quality software. Effectiveness is also determined by whether the computer is introduced as a means to an end or as an end in itself. Experts in the field recommend that computer skills be integrated into the regular curriculum rather than being taught as a separate subject of study.

#### Issues Related To Vocational Education Research

Numerous issues have been raised about vocational education, with each of these having implications for future research. While such issues may not reflect consensus, they communicate the opinions of certain population segments and should therefore receive consideration as research priorities are being established. Vocational education issues that have implications for research appear to focus on the following:

- \* Access to secondary vocational education is becoming increasingly limited.
- \* Increased high school graduation requirements may be negatively affecting vocational education enrollments.
- \* Women are still clustered in occupations in which they have been dominant throughout this country's history.
- \* Even within the same major occupational groups, women's earnings are lower than men's.

- \* There are numerous barriers to women's work equality, including discriminatory recruitment, hiring, and promotion practices.
- \* Schools should involve business, labor, and the community in key areas such as teacher development, curriculum updating and evaluation, and student employability.
- \* Business and labor must seek opportunities to work with schools and improve instructional practices.
- \* Entry-level workers' basic skills are not sufficient to provide a work force that is needed to compete in a global market.
- \* Minority students lag behind their white counterparts in reading and writing skills.
- \* Provision should be made for developing employment-related literacy among high school students.
- \* About 24% of high school youth drop out of school, with this figure reaching as high as 55% in some of the inner cities.
- \* When vocational education is coupled with other critical components of a dropout prevention program, dropout figures can be reduced.
- \* Future job displacement is likely to be more widespread than in the past and will affect a range of workers from skilled to unskilled.
- \* Training and retraining will be a part of every worker's life.
- \* Employers who hire young people below the age of 21 with less than a postsecondary degree hesitate to consider any who have less than 3 to 4 years of work experience.
- \* Youth unemployment continues to be a critical problem.
- \* The variety of options made available to youth will aid in solving some of the youth unemployment problems.

- \* Very little is known about the post-release experience of prisoners who receive specific kinds of training.
- \* There is a wide gap between inmate needs and available services.
- \* The increase in households headed by single women is one of the most significant factors contributing to increased poverty.
- \* Many single parents want to be self-supporting but are prevented from participating in job-training programs.
- \* Evidence suggests that persons whose native language is other than English have not experienced a high level of economic or occupational success.
- \* Bilingual vocational programs are being developed in a variety of areas and through various areas of support.
- \* There does not seem to be an overall plan to ensure that curriculum research contributes to the quality of vocational education.
- \* The vocational education curriculum should embrace technology.
- \* Today's programs should bridge the gap between so-called "academic" and "vocational" courses.
- \* Vocational teacher programs should be improved to reflect current research and development on teaching, learning, and instructional technology.
- \* Effective leadership at local, state, and federal levels is central to improving and expanding vocational education.
- \* Employers would like to see more school-to-work transition programs.
- \* Inadequate student knowledge constrains student access to vocational education.

- \* Guidance must be provided during the early and middle years of schooling, particularly to students who traditionally have not been well served by the schools.
- \* Development of entrepreneurial skills should be an integral part of most vocational education programs.
- \* Employers provide at least 17.6 million formal courses each year to almost 15 million trainees.
- \* The role of public and not-for-profit institutions is the wild card in the future of employee-based training.
- \* Large corporations have well-established training programs whereas smaller businesses employ the largest numbers of workers and often have less formal training programs.
- \* There appears to be great potential for corporate/education partnerships in relation to vocational teachers, learners, and graduates.
- \* Special-needs populations continue to have limited access to vocational education.
- \* Little is known about special-needs programming, students, and impact on employers.
- \* Interagency linkages must be strengthened if special-needs students are to be better served.

#### Recommendations For Research in Vocational Education

During the 1980s, a number of reports and papers have focused on what research should be conducted in vocational education. Recently many public agencies, research organizations, and educational groups have suggested research problems related to vocational education that need to be solved. Since it is impossible to list each recommendation in its

entirety, a listing of selected statements related to research has been prepared. Each statement may well serve as a basis for other possible research foci.

Consideration should be given to research in vocational education that deals with:

- \* Sources of social, demographic, and economic changes and their consequences for vocational education
- \* Providing more information about the different needs and characteristics of the variety of students enrolled in vocational education, as well as the duration and intensity of courses of study and the transition from school to work
- \* Effects of participating in vocational education
- \* Developing improved curricula, teaching techniques, and instructional instruments
- \* Developing strong, well-equipped research organizations
- \* Developing systematically planned R & D programs that produce cumulative knowledge
- \* Obtaining a better picture of the future
- \* Producing information and knowledge useful for policy assessment, modification, and formation
- \* Student employment as it relates to subsequent employment and education
- \* Review and perhaps reform of the processes used to prepare vocational teachers
- \* Preparing intellectual leadership for the vocational education field

- \* Interrelations between work and family
- \* Vocational education access
- \* Vocational education equity
- \* Applications of field-based learning
- \* Role of secondary and postsecondary vocational education
- \* Collaboration between vocational education and the private sector
- \* Vocational education as it relates to general or liberal education
- \* Emerging occupations and related education and training needs
- \* Improved graduate placement and subsequent career development
- \* Improved accuracy and utility of career information related to educational requirements and opportunities
- \* Standards for schools, programs, and teachers.