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ABSTRACT

This report presents outcomes of deliberations at the Tech Prep Leadership Summit on a "national vision" for tech prep. Following an introduction, Section 2 represents the consensus reached at the summit. Discussion of the purpose of tech prep focuses on the mission statement and goals of the Tech Prep Act. The discussion of program outcomes identifies nine general outcomes and addresses assessment and accountability and use of multiple outcome measures. Discussion of the target audience concludes that tech prep is an inclusive program for all students. Strategies for successful implementation as identified through discussion are grouped into four categories: planning and design, marketing, curricular and pedagogical, and early intervention. Section 3 highlights a few examples of the various approaches to tech prep being used in states to develop four general components: marketing campaigns, curriculum development, career guidance, and program improvement. Examples are provided of how states have spent their tech prep funds and tied tech prep to other state initiatives and of business and industry involvement in program development. Section 4 identifies strategies for implementing tech prep in urban schools. Section 5 discusses unresolved issues: creating demand for a high-skills work force, defining "technical," the role of public education, and similarities with other reform movements. Appendixes include the conference agenda, and participants' biographical sketches. (Contains 17 references.) (YLB)

National Center for Research in
Vocational Education

University of California, Berkeley

THE NATIONAL CENTER FOR RESEARCH IN VOCATIONAL EDUCATION

TECH PREP LEADERSHIP SUMMIT: A CONFERENCE REPORT

June 22-23, 1992
Chicago, Illinois

Supported by
the Office of Vocational and Adult Education,
U.S. Department of Education

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INTRODUCTION

The Summit

The Tech Prep Leadership Summit was held in Chicago, Illinois, June 22-23, 1992. The summit provided an opportunity for leaders concerned with the implementation of the Carl D. Perkins Vocational and Applied Technology Education Act Amendments of 1990 to gather together and discuss the Tech Prep Education Act. The summit was sponsored by the National Center for Research in Vocational Education (NCRVE) through a grant from the Office of Vocational and Adult Education of the U.S. Department of Education. The twenty-nine summit participants represented a diverse range of perspectives and organizational affiliations, including

- business, industry, and labor;
- community, junior, and technical colleges;
- elementary and secondary schools;
- federal and state education agencies;
- higher education and university teacher education;
- private, nonprofit organizations;
- professional organizations; and
- local Tech Prep consortia.

Biographical sketches are presented in Appendix B.

The Purpose

The purpose of the summit was twofold. First, and most immediately, the summit served as important preparation for NCRVE's first Summer Institute on Implementing Tech Prep Programs in Urban Schools. Secondly, the summit, by bringing together a distinguished panel of experts, served as a national forum

to add clarity and definition to the concept of Tech Prep. We asked summit participants to attempt to consensually agree to a "national vision" of Tech Prep. It is our hope that these discussions, deliberations, and findings will assist federal, state, and local officials and practitioners in better understanding and more effectively implementing this important reform strategy. It is our additional hope that the work of the summit will generate similar conversations in all parts of the country as educators and communities work to implement Tech Prep.

We believe that Tech Prep is a promising development which if properly implemented has the potential to lead to the improvement of secondary and postsecondary education as well as the school-to-work transition and to increase access of all Americans to a high quality work life that is not only economically rewarding but also personally fulfilling.

Organization of Conference Report

Following the introduction, this report presents the outcomes of our deliberations on a "national vision" for Tech Prep. The discussions focused on the purpose of Tech Prep, program outcomes, its target student population, and implementation strategies. The consensus outcomes are followed by a review of the summit's panel discussions. Individual panels were conducted to collect specific information on the issues from Tech Prep program directors, state administrators, and business and industry representatives. This conference report concludes with a description of strategies for implementing Tech Prep programs in urban schools and a discussion of unresolved issues raised during the summit.

The Need for Clarification

In conducting site visits to Tech Prep programs nationwide, the researchers at NCRVE repeatedly hear concerns from practitioners about the lack of a clear vision, purpose, and definition for Tech Prep. One reason for the lack of clarity is that the Tech Prep Act raises the need for answers to fundamental questions about the

appropriate role and function of job training and vocational education in the nation's public education system. What responsibilities belong to whom? Or what are the educational challenges of technological changes in the workplace?

In addition, summit participants agreed that if Tech Prep is to be a contending effort to better prepare students, then we need a common basis of understanding or we need a "national vision" that communities can refer to during the process of building consensus and forging agreement on a local vision.

A "NATIONAL VISION"

Reaching Consensus

The following sections represent the overall results of discussions by the summit participants as they proceeded to reach consensus on a "national vision" for Tech Prep. Prior to deciding as a group on this vision, the participants worked in small groups where they had the opportunity to discuss the issues in-depth. Each group was asked to consider the following questions:

- What is the purpose of Tech Prep?
- What outcomes are expected from Tech Prep?
- Who is the primary student audience for Tech Prep?
- What strategies can be used to implement Tech Prep?

The Societal Context

To begin addressing these questions and formulating a mission statement, the summit participants acknowledged the impact of several social, economic, and technological realities of contemporary U.S. society:

- America cannot compete successfully in global markets without an academically competent and technologically oriented society.
- We can help America's economy grow by increasing the proportion of youth employed in high skill, high wage jobs.
- America's educational systems and employers must recognize and nurture unique individual talents and abilities.
- A fully articulated and integrated K-14 workforce preparation plan in combination with improved classroom pedagogical strategies can help youth move further in formal education and ultimately in employer training programs, higher education, and careers.
- Early emphasis on career awareness and career exploration provides a sound basis for workforce preparation, lifelong learning, and productive employment throughout a lifetime.
- Public investment in human resource development through Tech Prep must be fully integrated with employers' ongoing commitments to invest in the skills of front-line workers. Tech Prep can enhance employers' investments in skill development but cannot substitute for the absence of a strong investment culture in American companies.

In order to accomplish this purpose we will need to begin by changing the mindset of educators, students, parents, and the "culture" at large about the value of vocational/ technical education and training.

—Gary Crocker, State Coordinator for Tech Prep, Maine

Mission Statement

Given this context, the participants agreed that *the overarching mission of Tech Prep is to prepare youth for participation in a world class workforce*. Furthermore, the purpose of Tech Prep is *to create consortia of institutions to provide educational opportunities that lead to a highly skilled qualified workforce that is better prepared to meet the needs of our globally competitive American economy.*

Goals of the Tech Prep Act

This mission statement complements the goals of the Tech Prep Education Act of 1990, including

- to infuse school with the meaning it often lacks for a large proportion of high school students—the "neglected majority";
- to create an education system that effectively and efficiently transitions young people from school-to-work and to further education;
- to produce a technically skilled workforce to fill the increasing number of technically demanding occupations.

Sample Program Interpretations

As with any major reform, the goals of the Tech Prep Act are ambitious. Furthermore, the act does not (nor should it) specify what schools are to do, and it does not address how to resolve any problems regarding program planning and implementation. Practitioners must interpret the legislation in an attempt to meet its goals. Interpretations of these goals are often presented in the school's program description brochure. For example, Richmond Community College (Hamlet, North Carolina), and Portland Community College (Portland, Oregon) offer the following program descriptions:

> The Tech Prep program provides students an opportunity to become part of a technically sophisticated workforce which can attract new industries and businesses.... A high school diploma is no longer the ticket to a good paying job.... The job market doesn't demand a great number of four-year college graduates. It does, however, demand employees who can solve technical problems and share ideas with others. (North Carolina Tech Prep Leadership Development Center, 1990, p. 2)

> How does a 2+2 program change what you study in high school? The answer depends on what you plan to do after you graduate from high school—even if your plans are tentative or indefinite right now. Fact: Better entry-level jobs, and careers with a future, require more than a high school diploma. You should be preparing for further education and training while still in high school. (Portland Community College, 1990, p. 2)

For a more detailed description of several program components, please see the examples provided by summit participants in the "Panel Discussions" section of this report.

Program Outcomes

Nine General Outcomes

While participants agreed that many outcomes will be established locally according to business and industry standards and local social and economic needs, several general outcomes were identified:

1. Increase levels of job satisfaction among graduates.
2. Increase advanced academic, technical, problem-solving, and teamwork competencies of students in preparation for high skilled workplaces.
3. Increase self-esteem of students and foster belief in the usefulness of their education.
4. Improve students' performance in postsecondary education and employer training programs.
5. Improve students' ability to integrate structured skills development in the course of employment with contextual learning in the classroom.
6. Increase the use of contextual learning and "nontraditional" teaching styles. Encourage teachers to rethink the ways they teach in an effort to provide students with more appropriate learning opportunities.
7. Increase retention, program completion, and graduation rates at both the secondary and postsecondary level.
8. Increase employers' levels of satisfaction with the entering workforce.

9. In turn, increase the legitimacy of Tech Prep; validate the program in the eyes of students, parents, and the general public as a viable and equal alternative to a college preparation program.

Assessment and Accountability

Summit participants agreed that outcomes assessment and accountability are a crucial aspect of Tech Prep and an area in which greater clarification and understanding is necessary. Various types of outcomes, including student outcomes and outcomes that can be linked to institutional accountability, need to be measured. Accountability in this case needs to be established for all Tech Prep stakeholders, not just schools and colleges.

> *Accountability gets lost [in programs like Tech Prep] and outcomes need to be established so that at various steps along the way there is accountability for the specific program components. It is difficult to imagine in the big picture what it means to say that each group is accountable to improvement of workforce quality—designation of this accountability mechanism must be left to the individual localities.*
>
> —Doug James, Superintendent, Richmond County Schools

Use Multiple Outcome Measures

Because of the complexities of Tech Prep, it was agreed that there must be multiple outcome measures, possibly categorized into primary and secondary outcomes. These measures must go beyond traditional testing and include authentic assessment. The student portfolio was discussed as one example of a more authentic, alternative assessment of student learning. Participants also felt that outcomes should be benchmarked to industry standards for human resource investment and global competitiveness. However, there was also some feeling among the group that learning the *process* in one industry can be applicable and transferable to other industries as well; therefore, all benchmarks need not be industry-specific.

Measure Incrementally

Once identified, outcomes should be measured incrementally to reflect the long-term development and implementation cycle of Tech Prep. Care must be taken to measure outcomes that can be accomplished given the lengthy time span required to put Tech Prep initiatives into place. For example, there is no way to fully measure outcomes in community college students until at least four or five years into the program, when a cohort of students has completed a full cycle of the sequenced program. Changes in workforce quality will not be measurable overnight. Adaptive evaluation systems must be developed that can follow students through complex patterns of educational preparation and workforce participation.

The Target Student Audience

An Inclusive Program for All Students

Although the language of the Perkins Amendments includes students who are at risk of dropping out of school and early advocates of Tech Prep targeted the "neglected majority" (Parnell, 1985), the summit participants believe we need to incorporate a wider student population into these programs. We need to focus on all students.

Participants also questioned the legislative definition of enrollment, confined to students in grades eleven through fourteen. The group rather quickly came to the agreement that students need to be aware and involved in decisions about their future much earlier than the eleventh grade and, therefore, that Tech Prep needs to begin at a much earlier age.

> *Our concern policywise in Michigan when we began to look at what was happening to students in those urban areas was that you lost them long before the eleventh and twelfth grade. . . . So, if you didn't begin in the middle school, . . . if you didn't begin by the time they were twelve, you had a problem.*
>
> —Lola Jackson, former State Director of Vocational Education in Michigan

After discussing the concerns, the participants arrived at the following consensus points:

- Tech Prep is designed for all students. Educational opportunities provided through Tech Prep are to be inclusive rather than exclusive. All students who have the desire to participate should be provided the opportunity to do so.

  We don't want this thing marketed to the middle fifty percent—this automatically says that twenty-five percent of the students are "too good" for it and places Tech Prep in a subservient role to college prep.

  —Russ Hamm, President, National Council for Occupational Education (NCOE)

- While Tech Prep is particularly well-suited to students in the general education track, it should not be seen as a second class approach to education for any student, including those at the top of the class. Tech Prep should challenge all students; at the same time, participants recognize the need to provide support services for students who may have difficulty succeeding in Tech Prep without them. Efforts should be made to help students who choose this option and who require additional support services in order to succeed.

  This ought not to pit college prep against career prep. . . . The notion is to blur the distinction between college prep and career prep tracks. Eventually, we'd like to see all students in a place where they're receiving high quality instruction with high quality skills.

  —Jerry Hayward, Deputy Director, NCRVE

Implementation Strategies

Summit participants agreed that successful implementation of Tech Prep could benefit from a set of strategies identified in current model programs. These strategies must be adapted according to the needs of the local site, but they represent important ideas for addressing the general goals and purposes of Tech Prep.

Planning and Design Strategies

- Conduct planning and implementation processes that include all stakeholders. Business and industry representatives stressed that they must be allowed to become active partners in curriculum development, outcomes identification, and evaluation. "There must be a commitment from all sides that we are in a shared partnership," commented one state administrator.

- Address local and regional needs in the development of individual Tech Prep programs.

- Design an articulated curriculum that has multiple entry and exit points throughout the four years of the program. This flexible curriculum would be designed to make Tech Prep an option for all students without eliminating those who are interested in both Tech Prep and college prep.

  There must be specific technical content at each grade level of Tech Prep. . . . I don't believe that everyone will go through the full four years or six years of the program. . . . Some will stop at the end of secondary education for a while and go to work, either because they can't afford to continue on to postsecondary education or whatever the reason might be.

  —Mike Snyder, Pennsylvania Department of Education

- Use multiple, alternative measures of accountability. It is important to be realistic in designing accountability measures and to recognize that many of the "successes" will not be measurable for several years since it takes students at least four years to get through an entire sequence of the program.

- Increase collaboration between "vocational" education departments and the other sectors of education at both the state and federal level. Without this collaboration, Tech Prep will be seen as purely a vocational program, making it difficult to get the commitment of all sectors.

Marketing Strategies

- Clarify the purpose of Tech Prep within consortia and then aggressively market the message to the community. For marketing to be effective, many participants emphasized the need for all active partners to have clarity of and commitment to the purpose of Tech Prep.
- Provide incentives for employers to become involved in Tech Prep. For instance, give some evidence that these programs will improve their "bottom line."
- In turn, improve the image of vocational and technical education in the eyes of the general public.

Curricular and Pedagogical Strategies

- Refocus and integrate academic and technical education to make curriculum relevant, up-to-date, meaningful, and useful to youth.
- Better training for teachers is necessary. Teachers who find ways to make learning come alive through collaboration and integration can make Tech Prep successful.

Early Intervention

- Start Tech Prep initiatives well before the junior year of high school.
- Beginning at the middle school level, utilize directed guidance and counseling to help students focus on their educational and career preparation goals. In addition, some collaboration with elementary schools is equally important.

PANEL DISCUSSIONS

Stakeholders Provide Examples

One of the major activities of the Tech Prep Leadership Summit was a series of panel discussions. Individual panels were established to give participants representing the local, state, and business and industry perspectives an opportunity to address the summit "vision" questions from their perspective. The diversity of information resulting from these panels was testimony to the number of successful program variations throughout the country. We have chosen to highlight a few of the examples given by our panelists; these are not necessarily "models" that the group felt should be followed elsewhere; rather, they provide examples of the various approaches to Tech Prep.

Local Program Descriptions of Tech Prep Components

Preliminary research on Tech Prep programs indicates that in 1991-1992 approximately 750 Tech Prep consortia existed at varying stages of operation (Bragg, 1991). Estimates increase that number to approximately 850 sites (Layton & Bragg, 1992). While no single model of Tech Prep meets the needs of all communities, there are four general components for each program: (1) marketing campaigns, (2) curriculum development, (3) career guidance, and (4) program improvement. Each program reflects a mixture of components operating at various stages of development (Dornsife, 1992). Several of the summit participants shared approaches they are using in their states to develop one or all of these components.

Information Campaigns and Marketing

Much of the responsibility for informing students and parents about Tech Prep falls on the guidance counselors. As reported by Diana Walter, Executive Director of the Partnership for Academic and Career Education (PACE) Consortium, for counselors at Pendleton High School, South Carolina, the biggest challenge is to discover ways of developing community awareness and support. Currently,

they are working to create an "alumni program" where Tech Prep alumni, once hired into a mid-level technology job, return to the school to tell parents and students about their experiences. They have also created a *Guide to Area Business Speakers* as a tool to developing more contacts and find out about local business and industry.

Curriculum Development

Diana Walter also shared material on the PACE curriculum component. For instance, the PACE Consortium developed math modules whereby students practice math applications in the areas of veterinary technology, engineering technology, insurance, and textile production. Each of the modules are developed around specific technical tasks students will encounter on the job. For example, the engineering modules expose students to statistics and the ways in which they are used to determine product quality. PACE is also currently working on developing modules for English I and II and the integration of humanities and technology.

Pendleton, South Carolina

Another feature of the PACE Consortium is teacher internships. These summer internships help teachers obtain information about technical and industrial careers, including information about career opportunities and academic and technical preparation for entry. Teachers study methods for making the high school curriculum more relevant and learn about existing and emerging technologies through field trips, demonstration tours, and presentations by local business and industry leaders.

Milwaukie, Oregon

Another panelist shared a unique approach to the development of Tech Prep curriculum. Sue Shields from Owen Sabin Occupational Skills Center in Milwaukie, Oregon, a school of two thousand students and thirteen career clusters, discussed the teacher curriculum groups operating in Oregon. As part of House Bill 3565, Oregon is in the process of developing specific curricular sequences students will begin after completing an Initial Certificate

of Mastery (age sixteen, grade ten). To develop the curriculum, teachers across the state are working in applied academic teams to create curriculum that integrates knowing (content) with doing (context).

According to Shields, this curriculum development structure matches her belief that in order to succeed, Tech Prep needs to be a grassroots movement, beginning with the teachers. To support teachers, schools need to invest in them by granting release time and more staff development opportunities so they will be adequately prepared.

Houston, Texas

The Gulf Coast Consortium in Houston uses yet another process for curriculum development. As reported by Julie Vitale, Tech Prep Project Coordinator, part of the Gulf Coast Consortium efforts have focused on using the state's Quality Workforce Planning effort by forming committees comprised equally of business and industry representatives and teachers. The role of these committees is to jointly define the local occupations and industries in demand in order to decide what programs to target for Tech Prep. Once this is decided, they work to revise the program and the necessary curriculum and skills specific to industry needs.

Career Guidance

All of the local program panelists described their consortia as working on guidance programs that introduce students to careers in middle and elementary school levels. For example, a middle school and high school in the PACE Consortium have collaborated in the development of a guide for eighth grade students to help them plan their high school curriculum. The guide is part of a comprehensive cooperative career awareness plan beginning in the middle school years. Using this system, students are better prepared to take advantage of their high school years and make informed choices early in their careers.

Program Evaluation

The economy of Richmond County, North Carolina, has been driven by the textile industry. Like most American manufacturers, the textile industries found themselves challenged by foreign competition. To help the industries better meet this challenge, the schools in Richmond County initiated reform based on the ideas of Tech Prep. As reported by Doug James, Superintendent of Richmond County, and Joe Grimsley, President, Richmond County Community College, the school began the process by convening a group of business, industry, and civic leaders; community members; and two hundred educators to develop education goals for economic growth. They agreed upon the following six goals: (1) improve student achievement in basic skills; (2) increase average SAT scores; (3) decrease dropout rates; (4) increase percentage of high school graduates attending four-year, two-year, or trade and technical schools; (5) increase technical literacy of all students; and (6) improve student attitudes toward school and learning.

Using these goals, the Richmond County school reform initiative created a unique feature: an accountability report card to keep track of their progress in these areas. This report card is published for the community to both document schools' progress and provide data to devise plans for program improvement. New strategies and methodologies for the classroom are constantly being considered and implemented in order to achieve the desired objectives.

Examples from the States

Every state has different approaches to Tech Prep, depending on their levels of resources and their specific economic and educational climates. The state representatives at the summit provided us with examples of how they have spent their Tech Prep funds and how they have tied Tech Prep in to other state initiatives.

Maine

Gary Crocker discussed the initial stages of the Tech Prep efforts in the state of Maine. To date, four of the five Tech Prep sites in the state are up and running, focusing on the involvement of and ultimate benefits to business and industry. "We're more concerned with creating a world-class workforce," comments Mr. Crocker, "because that's going to solve a lot of problems."

Kansas

According to Jean Davis, Kansas has also emphasized "the desire to meet the needs of business and industry" in its Tech Prep programs. The state is moving towards an outcomes-based approach in its educational system and emphasizes the report of the Secretary's Commission on Achieving Necessary Skills (SCANS) and workplace basics in establishing these outcomes. Says Ms. Davis, "The outcomes that we will address [with Tech Prep] . . . we hope . . . are the same outcomes that college-bound students will have, with the addition of technical skills and the fact that the curriculum will be offered in an integrated, applied setting." Kansas, as a member of the Southern Regional Education Board (SREB), wants to "expect more of kids"—all kids—through this new outcomes-based approach.

Michigan

Thirty-nine consortia composed of middle and secondary school districts, postsecondary institutions, and business and industry partners have been established as a primary component of Michigan's Tech Prep initiative. According to Lola Jackson, the purpose of these consortia is "to bring together education, business, and labor to work to create a system starting in the middle school and culminating in an associate's degree or two-year certificate, which will prepare youth and adults for entry into the labor market and into technical careers." The consortia are expected not only to develop a plan for the implementation of Tech Prep programs but also to address other educational reform initiatives in the state, making Tech Prep an integral part of the state's educational efforts.

Pennsylvania

In Pennsylvania, the state has established a set of assurances which serve as the basis for performance evaluation of Tech Prep programs. Michael Snyder highlighted three assurances that will be considered in the annual on-site monitoring of Pennsylvania's twenty-one Tech Prep consortia:

1. There must be specific technical content in each grade level of the Tech Prep program. (The state realizes that every student will not complete all four years of the program, and those who exit Tech Prep after just two years must have the benefit of some technical coursework.)

2. There must be *joint* staff development between the secondary and postsecondary educators.

3. Business and industry must participate in the writing of the curriculum.

Texas

Central to Tech Prep in Texas is the emphasis on integrating workplace basic skills into the curriculum for *all* students. The challenge, according to Carrie Nelson, is to integrate high quality applications and methodology courses in the curriculum for every student. An additional change which represents Texas' commitment to better education for all students involves the establishment of a goal of higher standards (as opposed to the traditional minimum standards) to which all students should be challenged. As Ms. Nelson argues, these new goals are higher now for every student than the previous set of outcomes established for those college-bound individuals.

Examples from Business and Industry

Representatives on this panel stressed the importance of business and industry involvement in the development of Tech Prep programs. This involvement should include curriculum

development, outcomes identification, and school-to-work transition activities. In addition, the panelists encouraged educators to initiate an ongoing dialogue with business and industry to provide incentives for business involvement and to get feedback on economic and labor market developments.

ELCO Industries

To be successful Tech Prep programs must begin to market a more mainstream image, according to Roger Pelkey, representing ELCO Industries in Rockford, Illinois. "Vocational education has a bad image—still does; Tech Prep hasn't changed that—most people don't even know what Tech Prep is." Through marketing efforts, we must begin to present Tech Prep on an equal function with all other disciplines, says Mr. Pelkey, in order to make Tech Prep economically more viable.

Allstate Insurance

Bill Walsh, a representative of Allstate Insurance, described the program his and several other insurance companies and banks have established with the Northwest Career Cooperative in Palatine, Illinois. The program with the Northwest Career Cooperative began with a partnership of approximately seven or eight banks and insurance companies. The partners worked with Harper College on changing their curriculum to include new courses aimed at helping individuals understand specific aspects of the industry. In addition, the cooperative established an internship program specifically for students between their senior year in high school and first year in college. Interns spend eight weeks in one of the sponsoring companies, and at least eighty percent of this time must be spent in the job in which they would like to work upon finishing the Tech Prep program. Interns also meet once a week with their mentor at the college to discuss career options. The benefit to the participating companies, says Mr. Walsh, is the preparation of industry-competent individuals prior to entrance into the workforce. In exchange, the companies agreed to recognize the associate's degree for positions that had previously required a bachelor's degree.

Companies agreed to offer higher-wage, higher-skill employment and trainee positions to graduates with an associate's degree.

Digital Equipment Corporation

Bob Darden, representing the Digital Equipment Corporation (DEC), discussed the potential for involvement and investment by large corporations in Tech Prep. DEC has been involved in a number of educational initiatives, including a recent agreement with the University of Maryland in which the company committed funds and equipment to the university for the development of a new communications training program. DEC was also involved in the development of courses and identification of competencies for this program, in which it will enroll several of its employees. While it is not "Tech Prep," this is, according to Mr. Darden, an example of how a large corporation can be convinced to support this type of program, particularly if there is some incentive involved.

California Foundation

Based on his experience with labor issues, Don Vial, Senior Analyst for California Foundation, emphasized the importance of approaching Tech Prep from a labor market perspective. "This program envisions a coordinated investment program with employers, educators, and the general public." Mr. Vial stressed that Tech Prep programs can only work if we have employer investments in training, that is, in changing the infrastructure to increase investment in front-line workers.

STRATEGIES FOR URBAN AREAS

Managing the transition from school-to-work presents one of the greatest challenges to young Americans. At a time when youth attend school for an ever increasing number of years or suffer high rates of unemployment if they do not, finding useful, interesting occupational careers is particularly difficult. The problems are most severe in those urban areas where the economy is in decline. Therefore, it is especially important for vocational education to assist urban youth in developing marketable skills and job contacts. In recognition of the obstacles confronting urban youth and in preparation for NCRVE's Summer Institute for Establishing Tech Prep Programs in Urban Schools, the summit participants discussed strategies for overcoming barriers unique to this environment. As represented by the statement below, the situation is not hopeless: It just requires a change of mindset and a commitment to the belief that there is hope for our urban youth.

> *The difficulty is not that these kids in urban schools cannot learn: It is because they have not been guided in terms of what will sustain them meaningfully and fully as a lifelong worker and learner. . . . We in education have to come to terms with the fact that the student sitting in front of us can learn—can be taught. They may not need to be taught the way we would like to teach them, or the way we think they ought to be taught, but they can learn.*
>
> —Bennie Lucroy, Center for Occupational Research and Development (CORD)

The summit participants identified the following strategies for urban school districts:

- **Link Tech Prep planning to urban economic development planning** and to the commitments of employers located in targeted urban areas to make substantial, ongoing investments in front-line workers. For example, service and health industries are increasingly important in urban areas and must become as much a part of the Tech Prep programs as the more traditional manufacturing industries. Other industries may have moved out of the immediate city limits, and strategies must include campaigning to bring businesses back into the city or devising the logistics to bring the students to the businesses.

  A possible strategy for an urban area would be to appeal to businesses that have either participated in an urban area or been a supporter of programs that had not previously worked in that area. Tech Prep can play a role in the rebuilding of some of the economic values within these troubled

communities if companies can be convinced that putting money into the educational environment is a way to rebuild and to avoid future losses.
—Bill Walsh, Allstate Insurance

- **Recognize that Tech Prep is one aspect of systemic change** required in urban settings: The program cannot solve all of our urban problems.

- **Develop support systems**, particularly through the guidance and counseling areas, that urban students need to be successful. Students need to be given a concept of "hope," provided by the promise of a meaningful job and a system that believes in them.

- **Develop broad-based curriculum** to help students broaden their horizons. In particular, create occupational clusters and use competency-based courses to provide students with foundational skills identified in SCANS.

CONCLUSION AND UNRESOLVED ISSUES

It was a productive two days. The summit participants ended their conversations with a clearer sense of the intent and promise of the Tech Prep Act. They also left with several unresolved questions and concerns. It will not be an easy process for any local consortia, either. Yet this in no way questions the importance or potential of Tech Prep reform. The work for NCRVE and all vocational education professionals is just beginning as we continue to face the following issues.

Creating the Demand for a High-Skills Workforce

Have we considered the business environment and the larger societal context, in addition to the needs of schools and students? An inadequately trained labor force is only one half of the picture. We must consider supply and demand. Business and industry need to create a demand for well-trained workers. Currently, there are barriers and disincentives they face that keep them from creating a workplace that can utilize more adequately prepared workers, such as cheap overseas labor markets, the current low skill base, and the decline of real wages. One way businesses can respond to the pressure of growing international competitiveness is to upgrade or renew the worker skill base or move away from Tayloristic models of organizations toward a new model of high performance workplace.

What Do We Mean by "Technical"

During their panel discussion, state representatives were asked to discuss how they define the "tech" in Tech Prep. This question raised a considerable amount of debate about whether Tech Prep should focus on what are traditionally considered "high tech" jobs only or areas for program development should be more broadly interpreted.

The participants agreed that it is *not* how one defines technical or technology that should influence Tech Prep program development.

Rather, the participants outlined three interdependent variables that should guide decisions regarding the appropriateness of a particular occupation for Tech Prep program development. They are (1) the integration of local, state, and national education reform initiatives; (2) data-driven economic development strategies based on projected local and regional labor market demand; and (3) the evolution of an internationally competitive high-performance workplace model. Each of the above variables presumes that for every Tech Prep program developed, *all* students exiting the program, at any point, will do so with higher levels of competence in mathematics, science, communications, technology, and workplace skills.

The Role of Public Education

What is the appropriate role for the nation's public education system in the area of job training and vocational education? This is a question of the underlying "purpose" of our education system. Educators, policymakers, and business and industry leaders must continue this debate to determine how involved schools will become in the training of the workforce. A critical part of this issue is the question of how business and industry is willing to invest in its front-line workers—that is, how the infrastructure of business and industry will adapt to Tech Prep programs.

How Does Tech Prep Fit with Other Reforms?

Although Tech Prep is located in the Office of Vocational and Adult Education, it is not to be ignored by mainstream school reform. Tech Prep is one of the few reforms that combines "knowing" and "doing" in the classroom—it contextualizes learning for the students.

Tech Prep is challenging institutional norms and methods of operation. It is forcing us to confront our assumptions about learning and the way we organize our schools, as are several other reform movements. In an effort to highlight the similarities between Tech Prep and other reform movements, the summit participants identified the following reforms for further consideration: school

restructuring, the effective schools initiative, community college curriculum, work-based learning, total quality management, and teacher preparation. A brief description of the similarities between these reforms is presented below.

The School Restructuring Movement

The main reform initiatives today are all included under the broad label of "restructuring." This is a fuzzy term that is used by many people in various ways. Restructuring is often defined, however, as redesigning schools away from Tayloristic notions of instructional design to recreate schools based on the cognitive science view of learning where students are actively involved in their learning process, forging new meaning with information (Andrew & Grubb, 1992). In essence, restructuring a school means redesigning curriculum and instruction, changing authority and decision-making processes, modifying staff roles, and implementing new accountability systems.

Tech Prep is complementary to restructuring because it, too, challenges institutional norms and methods of operation. For instance, at the heart of Tech Prep is articulated curriculum between secondary and postsecondary institutions. By definition, the use of articulated curriculum meets the call for changes in educational goals and instructional content. Furthermore, Tech Prep moves beyond most restructuring efforts because in addition to integrating vocational and academic curricula it connects schools to the world of work. Tech Prep is also school centered on a larger scale because business, labor, and both secondary and postsecondary institutions—all stakeholder groups—are included in local planning and decision making.

Effective Schools Initiative

Planning and implementing Tech Prep is part of a long-term and complex process requiring the coordination of numerous activities carried out by members of several committees. These committees represent an organizational infrastructure or foundation for Tech

Prep. As a result, school-site personnel who serve on these committees also make an array of decisions that guide program development.

The use of this type of infrastructure is complementary to the ideas based in the effective schools initiative. For example, proponents of the effective schools initiative are increasingly concerned with organizational issues such as decentralizing the structure, dispersing leadership, empowering others, and fostering a school culture supporting student success. In short, they are focusing on the processes of how to bring about restructuring as well as how to improve leadership, instruction, school climate, teacher expectations, and indicators of achievement (Holcomb & Peterson, 1991).

Community College Reforms

Tech Prep is an integral part of current curricular reform efforts at the community college level, particularly with regard to the integration of vocational and academic education. In their 1988 report, *Building Communities*, the Commission on the Future of Community Colleges recommends that community college faculty take the lead in closing the gap between the so-called "liberal" and the "useful" arts in an effort to improve all students' transitions from school to work. The commission urged faculty to "develop up-to-date programs that integrate the core curriculum and technical education" (p. 21). Innovative reforms addressing integration at the community college level, identified by Grubb and Kraskouskas (1992), include strong general education requirements for all students, the development of applied academics programs, cross-curricular programs like "writing across the curriculum," and the incorporation of academic modules in occupational courses.

Work-Based Learning: The Department of Labor

As stated in the recent SCANS report *Learning a Living: A Blueprint for High Performance* (1992), there is an urgent need for federal leaders to bring together the many efforts of business, labor,

and education. In short, the commission calls for building a partnership around employment skills—one that includes among others the U.S. Departments of Labor and Education. In part, the purpose of this national partnership is "to encourage a dialogue between these two major groups: one based largely in the world of work, the other consisting mostly of educators" (p. 23).

Of the many labor and education programs that could promote this partnership, perhaps the most complementary are Tech Prep programs (Department of Education [DOE]), and Work-Based Learning programs (Department of Labor [DOL]). Administered through the DOL's recently restructured apprenticeship and training office, the Office of Work-Based Learning is supporting the implementation of youth apprenticeship programs that combine features of Tech Prep programs. In particular, "their model combines paid work experience in a job relevant to student's career choice with a Tech Prep/2+2 program that results in a two-year associate degree" (Kazis & Roche, 1991, p.10). As a result of this combination, the youth apprenticeship model adds to the Tech Prep program a possibility of certification in occupational skills, the earning of an associate degree, and the use of new ways to integrate classroom and work-based learning (Shenon, 1992; see pp. 8, 43-46 for a complete description of this youth apprenticeship model).

Total Quality Management

A simple definition of total quality management (TQM) is "the unyielding and continually improving effort by everyone in an organization to understand, meet and exceed the expectations of customers" (Procter & Gamble, 1989, p. 1).

While educators traditionally do not think of their schools as businesses or their students as customers, there is a correlation between providing a service as educators do and producing a product as manufacturers do. At the most basic level, similarity lies in the fact that the end product in both situations has been achieved as a result of complex processes involving people. It is the act of

managing these complicated human processes that is the focus of TQM (Kirby & Bragg, 1992).

The goal of improving quality is at the heart of TQM and Tech Prep. Each initiative entails comprehensive change in the way business and education are conducted. Each provides a mechanism for reform. The eight prerequisites for TQM identified by Juran (1990) have been implemented by many American corporations. They have put into place management processes for moving toward improved quality and competitiveness. Those eight prerequisites have potential for Tech Prep implementation as well. The parallels between TQM and Tech Prep implementation include (1) use of a broad-based democratic process to create a vision of change and goals for improvement, (2) involvement of personnel at all levels of organizations, (3) education and training of all participants, (4) use of measurements to make improvements, and (5) ongoing review and feedback.

Teacher Preparation and Professional Development

Finally, it is important to consider the *unaddressed* reform issues of teacher preparation and professional development. Given the structure and intent of Tech Prep programs, these are major issues that must be addressed as Tech Prep moves forward. For example, classroom teachers need to reexamine their responsibilities as educators. They can no longer primarily be disseminators of knowledge or "content merchants" but must instead become human resource developers in the larger context of preparing young people for employment.

This changed mission and responsibility requires major professional development efforts at both the preservice and inservice level. At the preservice level, colleges and schools of education will need to make a number of changes in the preparation of future teachers, counselors, and administrators. Traditional preparation in disciplines and subject content will no longer meet the needs of Tech Prep reforms. At the inservice level, dynamic professional

development must address the philosophy and mindset of the current teaching force if education is to respond to Tech Prep reforms and their accompanying concepts.

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Appendix A

Leadership Summit Agenda

Monday, June 22, 1992

1:00 **Welcome**
Introductions
Expectations and Agenda Refinement

2:00 **The Local Perspective (Panel and Discussion)**
Joe Grimsley, *Richmond Community College*
Doug James, *Richmond County Schools*
Sue Shields, *North Clackamas School District*
Julie Vitale, *North Harris-Montgomery Community College*
Diana Walter, *Partnership for Academic and Career Education*

3:00 **The State Perspective (Panel and Discussion)**
Gary Crocker, *Maine*
Jean Davis, *Kansas*
Lola Jackson, *Michigan*
Carrie Nelson, *Texas*
Michael Snyder, *Pennsylvania*

4:00 **The Business, Industry, and Labor Perspective**
Robert Darden, *Digital Equipment Corporation*
Pat Derry, *Header Die & Tool*
Roger Pelkey, *ELCO Industries*
Don Vial, *California Foundation*
Bill Walsh, *Allstate Insurance*

5:00 **Consensus Building Activity**

Tuesday, June 23, 1992

8:30 **The Research Perspective**
Carolyn Dornsife, *NCRVE–Berkeley*
Debra Bragg, *NCRVE–Illinois*
James Hoerner, *NCRVE–Virginia Tech*
Darrell Clowes, *NCRVE–Virginia Tech*
Bennie Lucroy, *CORD*

9:30 **Small Group Discussions Focusing on**
Purpose
Audience
Outcomes
Implementation Issues and Strategies
Relationship to Educational Reform

1:00 **Large Group Discussion and Development of Consensus Statements**

3:30 **Next Steps**

Appendix B

Biographical Sketches of Participants

Debra Bragg
Debra Bragg is an Assistant Professor with joint appointments in the Departments of Vocational and Technical Education and Adult, Higher, and Continuing Education at the University of Illinois at Urbana-Champaign (UIUC). Her faculty responsibilities involve teaching graduate courses in postsecondary education policy and leadership, advising graduate students, conducting research, and providing service to the Illinois community college system. For the past three years, she has directed the Office of Community College Research and Leadership and NCRVE projects in the areas of Tech Prep, community college customized training, and postsecondary education outcomes evaluation. Dr. Bragg has work experience in public secondary and private sector education and training. She holds a Ph.D. in comprehensive vocational education from Ohio State University.

Nancy Smith Brooks
Nancy Smith Brooks is an Education Program Specialist with the U.S. Department of Education, Office of Vocational and Adult Education. Ms. Brooks is responsible for the provision of technical assistance to state and local personnel, and the evaluation of programs funded under the Perkins Act. In addition to serving as the leader of the department's Tech Prep team, Ms. Brooks writes and edits position and briefing papers on topics such as workplace literacy, school-to-work transition, and Tech Prep education programs. Ms. Brooks holds a Master's Degree in Social Foundations of Education from the University of Virginia.

Darrel Clowes
Darrel Clowes is the Tech Prep Assistant Project Director for NCRVE at Virginia Polytechnic and State University. Dr. Clowes has worked in, studied about, or researched and taught about community colleges as a teacher and administrator since 1964. His primary research areas have been the community college curriculum, postsecondary education broadly considered, and remediation. He has written extensively about remediation, served actively with the National Association for Developmental Education for some years, and currently serves on the editorial board of the major journal in the field. Dr. Clowes has recently written the definitive chapter on remediation in higher education for the eighth edition of the *Higher Education Yearbook.*

Gary Crocker
Gary Crocker is currently the Tech Prep Coordinator for the State of Maine. He received his bachelor's degree from the University of Maine and his Master's Degree in Adult Education from the University of Southern Maine. He has been employed by Maine's Technical College System since 1980 and has served as Dean of Continuing Education and Special Assistant for Economic Development prior to assuming his current duties as Director of State and Federal Programs/Tech Prep Coordinator for the Technical College System. Gary worked closely with the state department of education to develop a competitive grant process for Maine's Tech Prep funds which has resulted in the creation of five regional consortia and one statewide project.

Robert Darden
Robert Darden is a consultant in education systems integration with Digital Equipment Corporation (DEC) in Greenbelt, Maryland. Robert's current duties with DEC focus on business development in the public-private partnerships in education. He is responsible for identifying areas where DEC's experience in networking, systems integration, and business consulting can support the efforts of consortia involving secondary and postsecondary educational institutions and business/industry. Additionally, he consults with groups on training and skill development and conducts team building workshops based on personality types. Robert spent seven years with the Memphis City School system. For four years, he managed a cooperative training program where he taught half-time and supervised high school students on their jobs the remainder of the day. Three years were spent teaching machine shop in a technical center. Students included traditional high school students, adults, and limited-English proficient Laotian refugees, taught through an interpreter. Dr. Darden has a Bachelor of Arts in English and Philosophy, a Master's Degree in Technical Education, and a Doctorate of Education with concentration in curriculum and instruction in higher education.

Jean Davis
Jean Davis, formerly the Kansas State Vocational Education Planner, is now the Tech Prep Specialist for the state. Kansas has six federally funded and two locally funded Tech Prep programs. Jean has worked with local education agencies, community colleges, and technical centers to promote Tech Prep in the state. Kansas holds regular monthly statewide Tech Prep coordinators' meetings which provide immediate information and communication and an opportunity to provide "on time" inservices on topics ranging from overviews of Tech Prep to implementation. The first year of Tech Prep has been dedicated to planning; the second year will include curriculum development, articulation agreement finalization, and implementation. Jean has worked with Emporia State University, Kansas State University, business and industry, teacher and counselor groups, and others to promote the Tech Prep concept. She received her undergraduate degree from Washburn University and her master's degree from the University of Kansas.

Patrick Derry
Patrick Derry is the Executive Vice President of Header Die & Tool, Inc., in Rockford, Illinois. Mr. Derry's industrial experience includes manufacturing experience from shop foreman to vice president of manufacturing in medium to large size companies. In addition, he has served in human resources positions, including training and development and as director of human resources. For the past two and one-half years, Mr. Derry has served with the Tech Prep initiative in Rockford, Illinois, in the following areas: executive committee, industrial advancement, education design team liaison, and as host of teacher/industry workshops. Mr. Derry received his Bachelor of Science degree from St. Norbert College and his Master of Business degree from the University of Chicago.

Carolyn Dornsife
Carolyn Dornsife has worked at the University of California at Berkeley in the School of Education since 1986. She currently holds an academic appointment as a research associate with the National Center for Research in Vocational Education. In this position Carolyn serves as the NCRVE Tech Prep Project Director and is primarily responsible for collecting data on Tech Prep programs and coordinating all related research projects. The results of

her recent research activities are presented in the monograph *Beyond Articulation: The Development of Tech Prep Programs* (1992). Carolyn received her Ph.D. in Sociology from the University of Oregon, and her current focus on issues related to vocational education reflects an ongoing interest in the study of organizations and occupations.

Marvin Feldman
Marvin Feldman has served as President of the Fashion Institute of Technology (FIT) since 1971. FIT is a specialized college of art and design, business, and technology, under the State University of New York system. Prior to his tenure at FIT, Mr. Feldman was the Chairman and Executive Director of the Planning and Review Committee of the Office of Economic Opportunity for the federal government, a program officer in the Division of International Education and Research at the Ford Foundation, and a teacher and administrator at both the secondary and postsecondary levels. In addition, Mr. Feldman has held numerous assignments in the fields of education and technical assistance undertaken for foundations and for federal, state, local, and foreign governments. Mr. Feldman attended West Point and received his bachelor's degree and teaching credential from San Francisco State.

Joe Grimsely
Joe Grimsely has been the President of Richmond Community College in Hamlet, North Carolina, since 1985. Dr. Grimsely began work on the Tech Prep Associate Degree Project with Doug James, Superintendent of the Richmond County Schools, in the Spring of 1986. The project registered its first high school students in the Fall of 1987. Dr. Grimsely served as chairman of the Pee Dee Tech Prep Project, a four-county project, from 1989 to 1990. In addition, he served as chair of the North Carolina Tech Prep Leadership Development Center Advisory Committee in 1990 through 1992, and currently serves on the Tech Prep Associate Degree Advisory Committee created by the state boards of education and community colleges.

Gerald Hayward
Gerald Hayward is currently Deputy Director for the National Center for Research in Vocational Education located at the University of California at Berkeley. He serves on the board of Policy Analysis for California Education, an independent policy research center which provides analysis and assistance to California policymakers, educational leaders, and others. From 1980 to 1985, Mr. Hayward served as Chancellor of the California Community College and prior to that served for a decade as Principal Consultant to the Senate Committees on Education Finance. Hayward is a former teacher and administrator in California's public schools. Mr. Hayward is also a distinguished visiting senior lecturer at the University of California at Berkeley.

James Hoerner
James Hoerner is Professor of Vocational and Technical Education at Virginia Tech. Dr. Hoerner has extensive experience in the fields of articulation, Tech Prep, and professional development. During 1991 and 1992, he served as the director of the NCRVE project, Identification and Dissemination of Articulated Tech Prep Practices for At-Risk Students. Dr. Hoerner also serves on the Virginia State Tech Prep Steering Committee and is

associate director for the New River Valley Tech Prep 2+2+2 Project. Since 1987, Dr. Hoerner has published eleven publications and given over fifty state and national papers and presentations relating to Tech Prep and professional development.

Lola Jackson
Lola Jackson has worked for the Michigan Department of Education, Vocational-Technical Education Service since 1973. As state director from 1984 through 1992, Dr. Jackson was responsible for the administration of Michigan vocational-technical education programs at both the secondary and postsecondary levels. Dr. Jackson has also served as an instructor in vocational education and teacher training at Wayne State University and as a home economics and consumer education teacher in the Detroit public schools. Dr. Jackson holds a Ph.D. in Higher Education Administration from Michigan State University in East Lansing.

Doug James
Doug James has had experience as a teacher, principal, and assistant superintendent and has served as a public school superintendent for over nineteen years, the last nine in Richmond County, North Carolina. Dr. James, along with Joe Grimsely, president of Richmond Community College, was instrumental in the planning, development, and implementation of the first Tech Prep program in North Carolina and one of the first in the country beginning in 1986-1987. He has provided leadership in Tech Prep nationally by providing on-site visits, consultant services and technical assistance through Richmond County's Tech Prep Leadership Development Center. He also serves on the Committee of Practitioners and the North Carolina Tech Prep Advisory Committee of the State Department of Public Instruction and Department of Community Colleges. Dr. James received his B.S. and M.A. degrees from East Carolina University, completed studies for a certificate in school administration at the University of North Carolina–Chapel Hill, and earned the Ed.D. in school administration from Nova University in Fort Lauderdale, Florida.

Bennie Lucroy
Bennie Lucroy is the Director of the National Tech Prep Network for the Center for Occupational Research and Development (CORD) in Waco, Texas. Mr. Lucroy manages network services in the area of Tech Prep to over 1400 members and is responsible for planning and implementing national Tech Prep conferences. Prior to joining CORD, Mr. Lucroy was Director of Development for the Agency for Instructional Technology in Bloomington, Indiana, and Director of Education for the Mississippi Authority for Educational Television in Jackson, Mississippi. Mr. Lucroy received his Master's Degree in Education from the University of Southern Mississippi.

Carolyn Maddy-Bernstein
Carolyn Maddy-Bernstein is presently the Director and Principal Investigator of the Technical Assistance for Special Populations Program (TASPP) of the National Center for Research in Vocational Education at the UIUC site. After she received her Ed.D. from Virginia Tech in Career Counseling, she was employed there as the codirector of the Virginia Vocational Guidance Program. Dr. Maddy-Bernstein has been employed as a

vocational education administrator and supervisor of postsecondary programs for Boulder Area Technical Center in Boulder, Colorado, and has served as a Director of Guidance, a counselor, and a teacher in Virginia public schools. She has also conducted research on work values of females; and supervised funded projects to improve vocational guidance and counseling programs, to market vocational education, and to promote gender equity.

Carrie Nelson
Carrie Nelson is currently Program Director for Curriculum and Professional Development for the Community and Technical Colleges Division of the Texas Higher Education Coordinating Board. Her primary responsibilities include the development of policies and procedures for the review and approval of certificate and associate degree programs in community and technical colleges. Carrie also serves as the State Coordinator for Tech Prep in Texas, a tri-agency partnership initiative of the Coordinating Board, the Texas Education Agency, and the Texas Department of Commerce. Within this capacity, she directs the development of Tech Prep policies and procedures and directed the development of the tri-agency Tech Prep competitive grant process for regional planning and implementation, professional development, curriculum development, and statewide evaluation. After completing associate of applied science and bachelor of science degrees, she was awarded the NIH-NCI (National Institutes of Health–National Cancer Institute) carcinogenesis training grant for research in cancer immunology and earned a Ph.D. in Immunogenetics from the University of Texas at Austin. She has served as a lecturer at the University of Texas, as faculty and department head at Austin Community College, and has taught ninth through twelfth grade science.

Heidi Nyland
Heidi Nyland is doing research in benchmarking as a tool for implementation and continuous improvement in Tech Prep and other educational programs. She is currently with the Institute on Education and the Economy at Teachers College/Columbia University. Prior to the benchmarking project, she was a project developer for the Cumulative Curriculum Project in New York City, an effort to alter the current educational system through use of networked multimedia. She holds a B.F.A. from New York University in Film and an M.A. from Teachers College in Communications, Computing, and Technology.

Ginny Pease
Ginny Pease has been the project coordinator for the New Designs for the Comprehensive High School research project for NCRVE. With the research team of George Copa and Robert Beck, she has worked with teachers, students, and administrators doing field research on the integration of vocational and academic education in the comprehensive high school in Wisconsin and Minnesota. Prior to this research, Ms. Pease directed the first Education for Employment pilot project for the State of Wisconsin. She has extensive experience working with private employees and employers in the areas of workplace literacy, work readiness, and computer applications. Her teaching experience includes secondary school mathematics, computer applications, and special needs education. Ms. Pease is currently a doctoral candidate at the University of Minnesota, where her interest is in the restructuring of secondary school curriculum. She received her M.B.A and a B.A. in Mathematics Education from the University of Wisconsin at Madison.

Roger Pelkey
Roger Pelkey is the Corporate Manager of Training and Development for ELCO Industries, Inc., a components manufacturing firm for the Original Equipment Manufacturers Market in Rockford, Illinois. He also serves as the Tech Prep Industrial Advisory Committee chairperson, a consortium of manufacturing firms working to establish Tech Prep curricula in all area schools. This consortium has already established a highly respected Youth apprenticeship program and other work-based learning initiatives. Mr. Pelkey received a B.S. in Industrial Education from Wisconsin State University–Stout, and an M.A. in Industrial Education from East Tennessee State University. He has over twenty years experience in the vocational/technical/industrial instructional field, including the U.S. Air Force, vocational schools, and private industry.

Sue Shields
Sue Shields is the Staff Development Coordinator for the North Clackamas School District in Milwaukie, Oregon. A member of the Clackamas County Consortium, Ms. Shields is a speaker/consultant to schools on the role of the counselor in Tech Prep programs. In addition, she is the author of "A Counselor's Perspective of Tech Prep," a chapter in *Tech Prep Associate Degrees* by Dale Parnell and Dan Hull (1992).

Michael Snyder
Michael Snyder is the Tech Prep Coordinator for the Pennsylvania Department of Education's Bureau of Vocational-Technical Education. His position is to coordinate the efforts of the, currently, twenty-one competitively funded Tech Prep consortia in a statewide effort. He has had extensive dealings with private companies through the state's Customized Job Training program. Prior to these positions with the state, he was in charge of adult education, training, and apprenticeship programs with an area vocational-technical school. Mr. Snyder's background includes a B.S. in Psychology, a M.Ed. in Secondary Guidance, and a variety of courses in business management and educational administration.

Donald Vial
Donald Vial is a Senior Advisor for the California Foundation on the Environment and the Economy. He has extensive experience in labor relations, having served as Research and Education Director for the California AFL-CIO, as Chairman of the Center for Labor and Education at the University of California at Berkeley, and Director of the Industrial Relations Department for the State of California. Mr. Vial was commissioner of the California Public Utilities Commission and has served on the board of directors of the Industrial Relations Research Association, KQED Public TV, and the Northern California ACLU. Mr. Vial holds a Master's Degree in Economics from the University of California at Berkeley.

Bill Walsh
Bill Walsh is the Assistant Vice President, Operations Support for the Business Insurance Division of Allstate Insurance Company, headquartered in suburban Chicago. Bill has been with Allstate for twenty-nine years and has held numerous line and general management positions throughout the organization. In 1985, Bill was named as a business/industry representative on the advisory committee associated with a consolidated

vocational education institution in the Northwest suburbs of Chicago. That committee was instrumental in initiating a unique educational/industry partnership that culminated in a placement program for Tech Prep graduates as well as associated support programs for teachers and administrators. The committee has recently developed a unique industry support system for Tech Prep development featuring internships and career placement for graduates. Walsh is a graduate of Villanova University and is a U.S. Navy veteran.

Diana Walter
Diana Walter is the Executive Director of the Partnership for Academic and Career Education (PACE), a business and education consortium founded in 1987 to facilitate the development of Tech Prep programs in three South Carolina counties. She is involved in all aspects of Tech Prep planning and implementation, including coordination, curriculum development, faculty development, grant writing, evaluation, and assessment. Prior to working with PACE, Ms. Walter was affiliated with the Tri-County Technical College in Pendleton, South Carolina. Ms. Walter has published several articles on Tech Prep and has been a featured presenter at a number of local, state, and national Tech Prep conferences. She holds a Master of Education in Guidance and Psychological Services/Student Personnel from Springfield College in Springfield, MA.

Tim Wentling
Tim Wentling is an expert in the design and implementation of program evaluations. He is the author of five textbooks on the subject of evaluation, including *Evaluating Occupational Education and Training Programs and Measuring Student Growth: Techniques and Procedures for Occupational Education.* Dr. Wentling has directed numerous evaluations for private business as well as national and international organizations. His most recent efforts have been directed to the evaluation of Tech Prep for the Indiana State Board of Education and the design of a Tech Prep evaluation system for the State of Illinois. Professor Wentling has recently incorporated the use of concept mapping in the definition and delineation of Tech Prep. Dr. Wentling holds a Ph.D. with a specialization in educational evaluation and an M.B.A. with emphasis in personnel and financial management. He is currently a professor in and Head of the Department of Vocational and Technical Education at the University of Illinois at Urbana-Champaign.

Participants without Biographical Sketches

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