

BUSINESS-INDUSTRY-EDUCATION INVOLVEMENT
IN
TECH PREP PROGRAMS IN VIRGINIA

by

Thomas Lachowicz

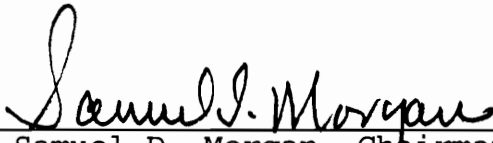
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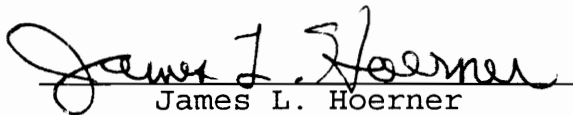
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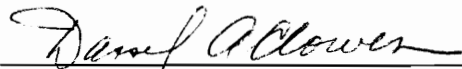
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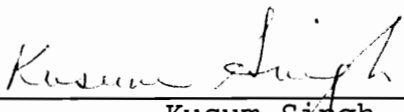
Community College Education

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(abstract)

Although Business-Industry-Education (B-I-E) involvement in Tech Prep programs is frequently discussed and encouraged in the literature, there was little information which identified what is meant by involvement. This study determined what constitutes B-I-E involvement in Tech Prep programs in Virginia's community colleges and secondary schools.

At the time of this study there were forty-four (44) Tech Prep projects in Virginia. Each Tech Prep project had at least one key person at the community college and at least one key person at the secondary schools in the community college service area. There are twenty-three (23) community colleges in Virginia with at least one Tech Prep project at each community college. Each community college in the consortium had at least one secondary school associated with it. In most instances, there were several secondary schools associated with each community college. The sample consisted of 23 key persons at the community colleges and 23 at the secondary schools.

The selection of the particular secondary school key person was done through purposive sampling, which intends to

select those subjects who can contribute most to the research either through maturity, strength, quality, and/or length of program. Through purposive sampling, secondary schools that could offer the most benefit for answering the research questions in this study were selected.

The general purpose of this study documented business-industry-education involvement in Tech Prep programs in Virginia's community colleges and secondary schools. In addition, the study synthesized the existing literature and research regarding business-industry-education involvement in Tech Prep programs in general.

The following research questions were addressed:

1. How is the level of business-industry-education (B-I-E) involvement in Tech Prep programs in Virginia's community colleges and secondary schools alike and how is it different?
2. What are the characteristics of business and industry involved in Tech Prep programs in Virginia?
3. What is the relationship between business-industry-education involvement in Tech Prep programs in general, compared with Tech Prep programs in Virginia?

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CHAPTER 1

INTRODUCTION

Tech Prep programs in the United States are designed to prepare students for careers in today's society--careers that demand technical knowledge and skills unheard of 25 years ago (Lankard, 1991), and for technical careers in the 21st century (Key, 1989; Parnell, 1991; Wimmer, 1988). Tech Prep programs encourage cooperative arrangements between secondary and postsecondary institutions (including community colleges and proprietary schools) which combine two years of high school courses with two years of advanced courses at the postsecondary level. In particular, Tech Prep is an articulated educational program consisting of two years of secondary school education and two years of postsecondary education with a common core of math, science, communication, and technology leading to an associate degree or certificate in a specific career field (Hoerner, 1991a).

National commitment to Tech Prep education programs is demonstrated through funding arrangements provided in the federal legislation by Public Law 101-392 approved on September 25, 1990. Public Law 101-392 amends "...the Carl D. Perkins Vocational Education Act (of 1984) to improve the provision of services under such Act and to extend the

authorities contained in such Act through fiscal year 1995, and for other purposes" (Public Law 101-392, 1990, 104 STAT. 753). The original Carl D. Perkins Vocational Education Act of 1984 authorized the United States government to spend up to \$1.6 billion a year on state and local programs that would teach the skills and competencies necessary to compete in a technologically advanced society (Wilcox, 1991). The amended Act of 1990, commonly referred to as the Perkins Act, authorized \$125 million and appropriated \$63.4 million to the states and territories for 1991-1992 to fund Tech Prep programs (United States Department of Education, Office of Vocational and Adult Education, 1991, January 18). Appropriations for Tech Prep programs were increased to \$90 million for 1992-1993 (Purcell, 1992a), and \$104.16 million for 1993-1994 (AVA, 1993a). The American Vocational Association (AVA) budget recommendations for 1994 and beyond suggested a minimum of \$250 million per year for Tech Prep.

In today's changing global economy with rapid technological change and international competition, the future U.S. workforce will find employment in business and industry requiring a highly skilled and trained workforce. Tech Prep programs provide a viable solution to training this workforce. Education in general, and community colleges and secondary schools in particular, will be instrumental in this training. Tech Prep provides

opportunities for students to obtain gainful employment or to continue towards a Bachelor's Degree.

Business and industry involvement in education is an important ingredient in funding applications for Tech Prep programs. Legislators highlighted business-industry-education involvement by stating that special consideration be given to applications for funds which, "...are developed in consultation with business, industry, and labor unions" (Public Law 101-392, 1990, 104 STAT. 791). The Law specifically stated that Tech Prep funds will go to consortia consisting of local educational agencies and nonprofit institutions of higher education (community colleges) and for profit institutions (proprietary schools) which offer a two-year associate degree program. The main purpose of the Act is "...to make the United States more competitive in the world economy by developing more fully the academic and occupational skills of all segments of the population" (Public Law 101-392, 1990, 104 STAT. 756).

One of the principal methods to achieve global competitiveness is concentration of resources on improved educational programs in technical fields. Tech Prep focuses on technical preparation in at least one field of engineering technology; applied science; mechanical, industrial, or practical art; trade; agriculture; health; or business. Improved educational programs and technical

preparation build student competencies in mathematics, science, communications, and technologies which lead to an associate degree or certificate. The goal is to place students in jobs which enable them to compete in the world economy.

Need For The Study

There is a growing national concern regarding employment opportunities for future workers in this country. Several documents (Commission on the Skills of the American Workforce, 1990; Secretary's Commission on Achieving Necessary Skills, 1991; United States Department of Education, 1990) indicated that a majority of occupations that will be in existence in the year 2000 are not in existence today. These same documents provided evidence that only 20-25% of the future job opportunities will require a four-year degree, and that the majority of the future jobs will require more than a secondary diploma and less than a four-year degree. Tech Prep provides a two-year degree or certificate, and an innovative approach to help meet future workforce requirements.

By law, B-I-E involvement is a significant part of Tech Prep programs. How this involvement occurs and what constitutes involvement is an important part of this study.

The major thrust of this study identifies, classifies, and documents B-I-E methods of involvement in Tech Prep programs in Virginia. The review of related literature and research provided the researcher with an opportunity to group methods of involvement into cluster areas as follows: (1) Career Information and Guidance; (2) Curriculum and Instruction; (3) Financial Aid; (4) Marketing and Recruitment; (5) Placement and Jobs; (6) Planning, Development, and Evaluation; and (7) Resources Other Than Financial.

Problem Statement

The review of related literature and research emphasizes the importance of business-industry-education (B-I-E) partnerships to develop and promote Tech Prep programs. Consequently, business and industry leaders work together with secondary and postsecondary educators to facilitate development and promotion of Tech Prep programs. While there is an overt call for partnerships and consultation in the Perkins Act, other methods for B-I-E involvement are left to each consortium. The procedural problem in this study was to identify, classify, and document B-I-E involvement in Tech Prep programs in Virginia's community colleges and secondary schools.

Purpose Statement

Due to a lack of identifiable methods for B-I-E involvement in Tech Prep programs, this study identified, classified, and documented these methods. The review of related literature and research, the development of a survey instrument, and the analysis of the responses to the survey instrument helped to accomplish this task. The general purpose of this study was to document B-I-E involvement in Tech Prep programs in Virginia's community colleges and secondary schools.

Research Questions

The following research questions were addressed:

1. How is the level of business-industry-education (B-I-E) involvement in Tech Prep programs in Virginia's community colleges and secondary schools alike and how is it different? Statistical analysis of responses to the questions regarding B-I-E methods of involvement on the survey instrument determined likenesses and differences.
2. What are the characteristics of business and industry involved in Tech Prep programs in Virginia? The responses to demographic questions on the survey

instrument determined business-industry characteristics.

3. What is the relationship between business-industry-education involvement in Tech Prep programs in general, compared with Tech Prep programs in Virginia? The relationship was addressed by comparing B-I-E involvement in Tech Prep programs in general, with those in Virginia.

Assumptions

The following assumptions provided a starting point for this study:

1. Business-industry-education involvement is important in Tech Prep program development in Virginia.
2. There are identifiable business-industry-education methods for involvement in Tech Prep programs in Virginia's community colleges and secondary schools.

Limitations

1. This study addresses Tech Prep programs in Virginia; therefore, the results may not be generalizable to other states.

2. Since this study does not include Tech Prep programs in two-year proprietary schools or other educational institutions outside of public secondary schools and community colleges, the results may not be generalizable to these schools or institutions.

Definitions

The following terms were used throughout this study.

Applied Academics. "Applied academics can be defined as the presentation of subject matter in a way that integrates a particular academic discipline such as mathematics, science, or English with personal work-force applications - hands-on laboratories dealing with practical equipment and devices" (Hull & Parnell, 1991, p. 70).

Apprenticeships. A workplace learning environment in which the student (apprentice) applies classroom learning in a hands-on, job-related context is often referred to as an apprenticeship program. "Apprenticeships combine structured workplace training with theoretical instruction allowing for learning to be applied within the content of real world settings" (Gilli & Gilli, 1992, p. 1).

Articulation Agreement. Articulation in Tech Prep can be defined by the Act itself which states that an articulation agreement "... means a commitment to a program designed to

provide students with a nonduplicative sequence of progressive achievement leading to competencies in a tech-prep education program" (Public Law 101-392, 1990, September 25, 104, STAT. 792).

Business-Industry-Education Partnerships. Partnerships formed by businesses and industries with educational institutions, usually in a formalized manner, are considered business-industry-education (B-I-E) partnerships.

Consortia. Consortia in Tech Prep programs refer to local educational agencies, intermediate educational agencies or area vocational schools, with formalized connections with nonprofit institutions of higher education which offer a two-year associate degree or certificate; or proprietary institutions of higher education which offer a two-year associate degree (Public Law 101-392, 1990, September 25).

Involvement. An operational definition of involvement for business-industry-education in Tech Prep programs includes a weighted count of the number of times that respondents answered questions on the survey instrument pertaining to methods of involvement. "Usually" was rated 4, "Often" a 3, "Sometimes" a 2, and "Almost Never" a 1. For example, a question that was answered by respondents with Usually 3 times, Often 2 times, Sometimes 0 times, and Almost Never 4 times would score $(3 \times 4 = 12) + (2 \times 3 = 6) + (1 \times 0 = 0) + (4 \times 1 = 4)$ a 22. The score of 22 divided by 9 equals a

mean of 2.44. The means of the scores provide a measure of B-I-E methods of involvement. High means are synonymous with high involvement. In many instances, the literature used the term "partnerships" synonymously for involvement. Tech Prep. Tech Prep is an articulated educational program of two years of secondary school and two years of postsecondary education which includes a common core of math, science, communications, and technologies designed to lead to an associate degree or certificate in a specific career field (Hoerner, 1991a).

Organization of the Study

This study is organized in five chapters. Chapter One includes an introduction, need for the study, problem statement, purpose statement, research questions, assumptions, limitations, definitions, organization of the study, and a chapter summary. Chapter Two contains a review of related literature and research of Tech Prep programs with business and industry involvement including the foundations of Tech Prep programs, definitions of Tech Prep and the Perkins Act, importance of B-I-E involvement, workforce development, contrary views, and a chapter summary. Chapter Three outlines the research design and methodology including a discussion of the population and

sample, development of the questionnaire, data collection procedures, data analysis, and a chapter summary. Chapter Four reports the findings based on the responses to the Questionnaire in Appendix A, a description of the respondents, analysis of research questions, and a chapter summary. Chapter Five provides a summary, discussion, conclusions, and recommendations.

Chapter Summary

This chapter began with the importance of preparing students for careers today and in the future in order for the United States to compete successfully in the global economy. Tech Prep provides training in these careers through formalized articulation agreements between secondary and postsecondary institutions which includes business and industry involvement. While involvement is encouraged by the Perkins Act which funds Tech Prep programs, methods of involvement are left up to individual consortia. The main purpose of the Perkins Act is to help make the United States more competitive in the world economy by developing the academic and occupational skills for all segments of the population.

This study focused on the review of the related literature and research to identify, classify, and document

methods of involvement. These methods were grouped into seven clusters: (1) Career Information and Guidance; (2) Curriculum and Instruction; (3) Financial Aid; (4) Marketing and Recruitment; (5) Placement and Jobs; (6) Planning, Development, and Evaluation; and (7) Resources Other Than Financial.

The survey instrument (Questionnaire in Appendix A) included the seven cluster areas. The procedural problem and the general purpose of this research study were to identify, classify, and document methods for B-I-E involvement in Tech Prep programs in Virginia's community colleges and secondary schools. The statistical analysis of the responses to the survey instrument answered the three research questions. This chapter concluded with the study's assumptions, limitations, definitions, and overall organization.

CHAPTER 2

REVIEW OF THE RELATED LITERATURE AND RESEARCH

This chapter presents a review of the related literature and research as it applies to business-industry-education (B-I-E) involvement in Tech Prep programs. There are many resources including books, articles, and papers pertaining to partnerships and involvement in Tech Prep programs. Consequently, the main thrust of the review of the related literature and research was to determine what had been written about business-industry-education methods of involvement in Tech Prep programs in community colleges and secondary schools.

Linkage of business and industry with educational institutions in Tech Prep programs is strongly encouraged by the Perkins Act. It is the opinion of the researcher that B-I-E involvement will help promote Tech Prep programs in community colleges and secondary schools. In addition, the Perkins Act specifically states that Tech Prep programs which are developed in consultation with business and industry will be given special consideration for funding applications. The literature review and research identified, classified, and documented methods of B-I-E involvement.

An extensive review of the literature was conducted using the Educational Resources Information Center (ERIC) data base, as well as other available resources. The researcher searched ERIC by focusing on the major constructs of Tech Prep and business-industry partnerships, including, but not limited to, business-industry partnerships; Tech Prep; community colleges and industry; and community colleges and business-industry partnerships. The following resources were among the most utilized: ERIC; the National Center for Research in Vocational Education (NCRVE) at the University of California, in Berkeley, and at Virginia Polytechnic and State University in Blacksburg, Virginia; the Center for Occupational Research (CORD) in Waco, Texas; and the Virginia Tech Library System (VTLS) at Virginia Tech in Blacksburg, Virginia.

In the ERIC database, there were only five articles that dealt with community college and business-industry partnerships; nine that dealt with B-I-E partnerships; three that dealt with Tech Prep, community colleges and industry; and none which dealt with Tech Prep and business-industry-education partnerships. Information about B-I-E involvement came from conference proceedings, NCRVE research, Tech Prep program announcements, documents from individual consortium, CORD, and other practitioner literature. The ERIC database was helpful in identifying Tech Prep articles in general.

By using all of these resources, B-I-E methods of involvement were able to be pieced together to develop the survey instrument.

The numerous articles, case studies, and conference proceedings about Tech Prep programs in general, and community colleges and B-I-E involvement in particular, are indicative of the formative nature of Tech Prep. Many practitioner articles address the importance of B-I-E involvement. However, in most instances, they neither detail what involvement means nor how it occurs. There does not appear to be a lack of agreement on the importance of B-I-E involvement, but there does appear to be a lack of a strong, clear sense of what involvement consists of and how it occurs.

Literature Related to B-I-E Involvement in Tech Prep

The Perkins Act encourages B-I-E consultation (Public Law 101-392, 1990, September 25, 104, STAT. 791); applied academic advocates, including Hull & Parnell (1991), encourage B-I-E involvement; and the champions for a renewed workforce clamor for B-I-E involvement (Commission on the Skills of the American Workforce, 1990). The literature revealed well-documented articulation efforts (Dornsfeld, 1992), curriculum and instruction development (Dunn, 1992;

Wimmer, 1992), and Tech Prep marketing efforts (Hull & Parnell, 1991). However, literature which specifically dealt with B-I-E methods of involvement in Tech Prep programs in community colleges and secondary schools was not readily apparent. This review of the related literature and research sought to bring methods of B-I-E methods of involvement to the surface.

Major Categories of the Literature Review

This literature review includes:

- (1) foundations of Tech Prep programs;
- (2) definitions of Tech Prep and the Perkins Act;
- (3) importance of business-industry-education involvement;
- (4) workforce development;
- (4) contrary views; and
- (5) a chapter summary.

Foundations of Tech Prep Programs

The foundations of Tech Prep may be traced back to 1925 when a similar concept was introduced by Koos (1929) in The Junior College (Hoerner, Clowes, Lachowicz, Wehrley, & Hammons, 1992). Dornsife (1992) suggested that the first major attempt to establish the concept underlying Tech Prep was a result of federal manpower legislation such as The

Manpower Development and Training Act of 1962, and the Vocational Education Act of 1963. Feldman (1988) mentioned that the Tech Prep concept can be traced back to successful developmental programs in operation twenty years ago. The Carl D. Perkins Vocational Education Act of 1984 made provisions for an articulated curriculum between secondary and postsecondary institutions, which is one of the major, underlying concepts of Tech Prep programs. The Perkins Act of 1990 gave Tech Prep official, government recognition and funding. Thus, the Tech Prep concept is not new and may be traced back from the Perkins Act of 1990, to 1925.

Hull and Parnell brought Tech Prep to the forefront in educational reform literature. Parnell's 1984 concept paper advocated development of a 2 + 2 Tech Prep/Associate Degree program to provide access to a mid-level range of career choices centering around technical preparation. Parnell suggested that technicians will characterize the mainstream development of the nation's workforce in the future. His 1985 concept paper dealt with the problem of unfocused learning and encouraged a greater degree of connectedness between the classroom and "real life" through a four-year Tech-Prep/Associate Degree program. In The Neglected Majority, Parnell (1985) advocated bringing into focus the "forgotten half" that is, the 50-60% of high school students who are in the "general track", which neither prepares nor

assists them for further education or productive employment. The concept papers and the book led to the first complete treatment of Tech Prep in Hull & Parnell's Tech Prep Associate Degree: A Win/Win Experience, (1991).

Definitions of Tech Prep and the Perkins Act

The literature suggested that there was no consensus for a definition for Tech Prep. While many states have their own definitions, there was no common definition between states. Even within the same state, among various consortia, there was no consensus for a common definition. In Tech Prep meetings and training sessions in Virginia, a recurring question was "What is Tech Prep?"

In the Perkins Act, a Tech Prep Education Program is defined, but not Tech Prep. However, the literature generally spoke of Tech Prep rather than a Tech Prep Education Program. The Perkins Act states "The term 'tech prep education program' means a combined secondary and postsecondary program which--

"(A) leads to an associate degree or 2-year certificate;

"(B) provides technical preparation in at least 1 field of engineering technology, applied science, mechanical, industrial, or practical art or trade, or agriculture, health, or business;

"(C) builds student competence in mathematics, science, and communications (including through applied academics) through a sequential course of study; and

"(D) leads to placement in employment" (Public Law 101-392, 1990, September 25, 104, STAT. 792).

Section 344 of the Perkins Act identifies the contents of Tech Prep Education Programs as follows:

"(1) be carried out under an articulation agreement between the participants in the consortium;

"(2) consist of the 2 years of secondary school preceding graduation and 2 years of higher education, or an apprenticeship program of at least 2 years following secondary instruction, with a common core of required proficiency in mathematics, science, communications, and technologies designed to lead to an associate degree or certificate in a specific career field;

"(3) include the development of tech-prep education program curricula appropriate to the needs of the consortium participants;

"(4) include in-service training for teachers that--...;

"(5) include training programs for counselors designed to enable counselors to more effectively--...;

"(6) provide equal access to the full range of technical preparation programs to individuals who are members of special populations, including the development of tech-prep

education services appropriate to the needs of such individuals; and

"(7) provide for preparatory services which assist all participants in such programs" (Public Law 101-392, 1990, September 25, 104, STAT. 790-791).

Given the definition and contents of a Tech Prep Education Program as prescribed in the Perkins Act, then any definition of a Tech Prep Education Program would be the same. However, if a state defines "Tech Prep" as opposed to a "Tech Prep Education Program" as is commonly done, then each state has some latitude in defining, designing, and implementing Tech Prep programs. Most states attempt to define Tech Prep in ways that incorporate the intent of the Perkins Act and adhere to the requirements of a Tech Prep Education Program. For example, in Virginia, Tech Prep is defined as follows:

- a four-year associate degree program that begins in the 11th grade (or earlier) and culminates with an associate degree, or leads into a baccalaureate degree
- a focused program of study that includes math, science, language arts, and technology studies, all taught in an applied setting
- a program that prepares students for further education and an occupational pursuit

- a program that encourages students to explore a number of career options
- a program that helps to prepare tomorrow's technicians
- a program that increases students' potential for success in school and in the chosen career, thus reducing the number of school drop-outs (Staff, 1991, Facts and Figures on Tech Prep, p. 1).

Further definitions of Tech Prep revolved around questions such as "What is Tech Prep?" and "What is the purpose of Tech Prep?" The Roanoke Area Tech Prep Consortium in Roanoke, Virginia, answered the first question with "Tech Prep is a challenging program of study designed to assure that high school students acquire more technically-oriented knowledge and skills. This coordinated sequence of academic and vocational courses prepares students for lifelong learning through employment, advanced study at the community college level and continued education at a four year college" (Staff, 1992, p. 1, What Is Tech Prep). In response to the second question, "What is the purpose of Tech Prep," the Roanoke Area Tech Prep Consortium offered, "To better prepare students for the changing demands of the workplace through a combination of strong academic and technical skills training for Tech Prep careers" (Staff, 1992, p. 1, What Is Tech Prep).

Other consortia defined Tech Prep based on the Perkins Act, some variation of it, the state of Virginia's Facts and Figures, and/or the Roanoke Area Tech Prep Consortium's comments on "What is Tech Prep." When Tech Prep is defined by most authors, the definition most often used is that given in the Perkins Act. Thus, while there is no common definition of Tech Prep, most definitions are grounded in the Perkins Act.

In the original Carl D. Perkins Vocational Education Act of 1984, no mention was made of Tech Prep. In the Perkins Act of 1990, Tech Prep is mentioned under Title III, Part E--Tech-Prep Education. Betsy Brand, United States Director of Vocational and Adult Education, in Legislative Update (1990a) and What's Ahead for Employment and Training (1990c) stated that Tech Prep provides an education program leading to a two-year associate degree or certificate, offers a link between secondary and postsecondary institutions, integrates academics and vocational curriculum, and involves business in education. Wilcox (1991) suggested that the Perkins Act has two major purposes: (1) improves America's high-tech competitiveness, and (2) provides greater vocational education opportunities for disadvantaged. This is in accordance with the Hearings on H.R. 7, A Bill to Extend the Carl D. Perkins Vocational Education Act and H.R. 22, Tech-Prep Education Act (1989).

These hearings suggested that Tech Prep be integrated into the Perkins Act and called for amendments that would improve implementation, particularly for disadvantaged youth. The AVA also called for reauthorization of the Perkins Act with the Tech-Prep Education Program becoming part of the Perkins Act. The AVA emphasized serving disadvantaged and limited English proficiency populations (1989).

The National Center for Research in Vocational Education (NCRVE) issued a "tip sheet" for education writers which included the Perkins Act in general, and Tech Prep in particular. In the tip sheet Hayward, (1992) outlined must statements in order for Tech Prep programs to be eligible for funding as follows:

- (1) written agreements between participating secondary and postsecondary institutions;
- (2) at least two years of secondary school prior to graduation and at least two years of postsecondary education; and
- (3) common core of required proficiency in math, science, communications, and technologies (p. 5).

The Perkins Act also encouraged specific curricula tailored to the needs of participants, and in-service training for teachers and counselors. Hayward focused on the disadvantaged as well saying, "It (Tech Prep) is especially designed for the needs of the 'neglected

majority' of non-college or non-university-bound students who are enrolled in 'general education' courses. These general courses traditionally have lacked the rigor of the college-prep curriculum or the job-specific practicality of the vocational curriculum, leaving students equipped for neither college nor work" (1992, p. 4).

The Office of Vocational and Adult Education (1991) stated that the main purpose of the Perkins Act, through Tech Prep education, is to make the United States more competitive in the world economy and to develop a workforce with the skills needed to work in a technologically advanced society. Hoerner (1991b, 1991c) emphasized that Tech Prep programs must make education relevant for the U.S. workforce by encouraging links with business and industry. The Center for Occupational Research & Development (CORD, 1991) stated that the Perkins Act helps to create educational reform by providing opportunities for students to participate in the restructured workforce.

The Perkins Act provides for apprenticeships of at least two years following secondary education (Public Law 101-392, 1990, STAT. 790). Lewis (1991) is one of only a few authors who advocated and discussed apprenticeships in business and industry as a result of the Perkins Act. Jennings (1991) commented that Congress intended for the Perkins Act to help vocational education through its

emphasis on applied academics. The Perkins Act also challenges vocational education through its mandate to develop and implement accountability systems which document the progress of vocational education students and programs. Grubb in "The Challenge to Change" (1991) stated that Perkins requires integrating academic and vocational education by integrating academic and vocational coursework, getting academic and vocational teachers to work together, and encouraging occupational clusters and career paths.

Purcell in "Challenges of Reforming Education" (1992a) and "Curricula for a Changing World" (1992b) furthered the challenge to change and reform education. He stated that the Perkins Act, through Tech Prep, transforms vocational education by integrating curriculum and strengthening connections between secondary and postsecondary education. Amidst all the challenges to change, Warnat, Director of Vocational-Technical Education in the U.S. Department of Education, lamented that the Perkins Act does not give enough clout to Tech Prep to ensure necessary employer involvement (AVA's Organization News in Tech Directions, 1993b).

Tech Prep definitions emphasize the importance of a two-year degree or certificate, technical preparation, applied academics, and placement in employment. These definitions emanate from the Perkins Act and most states

incorporate the elements of the definition and content of the Perkins Act in their respective definitions. With employer involvement a necessary ingredient, the next section examines B-I-E involvement in Tech Prep programs.

Importance of Business-Industry-Education Involvement

The literature review and research strongly encourage and support B-I-E involvement in Tech Prep programs. Many authors consider B-I-E involvement essential to and necessary for program development and success. Articles, conference proceedings, books, and papers refer to the necessity of B-I-E involvement in community colleges and secondary schools. While the link between Tech Prep and B-I-E involvement is frequently mentioned, particular methods for promoting this involvement appear to be lacking.

The findings of the Perkins Act stress the importance of preparing youth for the workforce through B-I-E involvement in secondary schools and community colleges. For instance, in Section 342 of Public Law 101-392 (September 25, 1990) STAT. 789, Congress finds that: "(1) rapid technological advances and global competition demand increased level of skilled technical education...(for) youths entering the workforce;

"(2) effective strategies reaching beyond the boundaries of traditional schooling are necessary...in the lives of students;

"(3) a combination of nontraditional school-to-work technical education programs...will reduce the dropout rate for high school students...;

"(4) the establishment of systematic technical education articulation agreements between secondary schools and postsecondary institutions is necessary for providing youth with skills...for finding a position in a changing workplace;

"(5) by the year 2000 an estimated 15,000,000 manufacturing jobs will require more advanced technical skills, and an equal number of service jobs will become obsolete;

"(6) more than 50 percent of jobs that are developing will require skills greater than those provided by existing educational programs;

"(7) dropout rates in urban schools are 50 percent or higher, and more than 50 percent of all Hispanic youth drop out of high school; and

"(8) employers in the United States pay an estimated \$210,000,000,000 annually for formal and informal training, remediation, and lost productivity as a result of untrained and unprepared youth joining, or attempting to join, the workforce of the United States."

With these findings, Congress proposed that Tech Prep Education Programs will help prepare youth for tomorrow's workforce. An overriding emphasis is to provide education for youth which will lead to gainful employment. Section 345 of the Perkins Act of 1990 gives special consideration to applications for grants which--

"(1) provide for effective employment placement activities or transfer of students to 4-year baccalaureate degree programs;

"(2) are developed in consultation with business, industry, and labor unions; and

"(3) address effectively the issues of dropout prevention and re-entry and the needs of minority youths, youths of limited English proficiency, youths with handicaps, and disadvantaged youths" (Public Law 101-392, STAT 791).

With the emphasis on jobs and special consideration for funding applications in Tech Prep programs with business-industry involvement according to Section 345 of the Perkins Act, this section examines what involvement consists of in Tech Prep programs in community colleges and secondary schools.

In the early years of Tech Prep, the literature did not address B-I-E methods of involvement as frequently as in recent years. Another early trend is that articles discuss involvement, in general, without mentioning methods of

involvement. In the early literature, B-I-E involvement in Tech Prep programs in community colleges and secondary schools appears to be synonymous with support, communication, connections, participation, commitment, partnerships, planning, and cooperation. The following examples illustrate the emphasis on these terms.

In Wisconsin, Grover (1991) emphasized the importance of B-I-E support. In Texas, the emphasis included B-I-E involvement in communication and partnerships (Carnes, 1991; Key, 1992; Texas Higher Education Coordinating Board, 1991). Kentucky (Kentucky Community College System, 1992) focused on B-I-E connections. Illinois (Miguel, 1990) dealt with B-I-E participation and commitment. In Virginia, the overriding emphasis was on B-I-E partnerships (Hoerner, 1991b; Roanoke Area Tech Prep Consortium, 1992; Staff, VCCS Deans/Provosts Meeting and Tech Prep Conference, 1991; Thompson, 1992). Utah also focused on B-I-E partnerships (Gonzales, 1992). In Indiana, Hoke & Suba (1992) emphasized the importance of B-I-E planning. Delaware's Compendium of Models for Tech Prep (Staff, 1989, 1990) discussed a Business, Industry, Education Alliance (BIE) with the main focus on cooperation and active participation with business. These are a sample of states that mention B-I-E involvement in terms that appear to be synonymous, such as: support,

communication, connections, participation, commitment, partnerships, planning, and cooperation.

Several authors generalize on the importance of B-I-E involvement (including support, communication, connections, participation, commitment, partnerships, planning, and cooperation) for Tech Prep programs in community colleges and secondary schools. In this study, about 53% (96 of 180) of the articles, books, documents, papers, and proceedings referred to B-I-E involvement.

In Tech Prep Programs: A National Study (Hoerner & Clowes, 1992), one of the research questions addressed employer participation through curriculum development, cooperative programs, on-the-job training, apprenticeships, internships, mentorships, and financial support. The study discovered that of 200 institutions which responded with 238 Tech Prep programs, 190 programs (about 80%) had some kind of employer participation.

Perkins Act.

Of the various methods for B-I-E involvement, one that is most frequently mentioned is partnerships. A majority of the articles recognize and address the importance of partnerships. Some articles specifically state how B-I-E involvement through partnerships can be translated into action. For example, Hata (1990) suggested that business and industry become involved by providing equipment for

schools and jobs for students. Brand (1990b) stated that business and education have an important role to play by ensuring that students get the skills needed for available jobs. Marsalis (1991) summarized employer involvement with efforts such as:

- * providing or loaning equipment to schools,
- * providing space for classes,
- * providing student and teacher awards and scholarships,
- * releasing personnel to teach in schools,
- * participating in adopt-a-school programs,
- * serving on advisory committees,
- * arranging for student plant tours,
- * providing speakers for industry-education days,
- * participating in mentoring programs,
- * becoming involved in career awareness,
- * participating in work-based learning, and
- * providing adult retraining" (pp. 280-281).

Rice (1991) followed up the importance of mentoring by detailing methods for designing and operating a Tech Prep Associate Degree Mentoring Program. Rice elaborated on the qualifications and criteria for choosing mentors in business and industry, activities for each grade level, and a method for evaluation. Mentor involvement with students included special activities at their companies, sharing trade publications, tutoring, working together on technical

projects, meeting and talking with parents, celebrating successes, and discussing changes in the profession.

The call for B-I-E partnerships (a term often used synonymously for involvement in Tech Prep programs in community colleges and secondary schools) was prevalent throughout the literature. In most instances, the authors stated the importance of partnerships without giving explicit details as to what B-I-E partnership involvement consists of in Tech Prep programs (Beckley et al., 1989; Brock & Purdy, 1991; Dutton, 1991; Immerwahr et al., 1991). There was recognition of the importance of partnerships because of the \$10 million dollars that Perkins provided for B-I-E partnerships in 1991 (Wilcox, 1991). Even small and minority business partnerships in Tech Prep programs were advocated (Cahill, 1992). Wuertele (1990) felt that there was more than enough talk about forming partnerships and clamored for doing something tangible instead of calling for more partnerships. With the emphasis on B-I-E partnerships from 1989 through 1993, Warnat felt that these partnerships did not give enough strength to employer involvement (AVA, Organization News, 1993b).

While B-I-E involvement is recognized as important, agreement on methods of involvement is not unanimous. For example, some authors favored employer involvement in curriculum development (DiPietro, 1991; Dornsife, 1992;

Dunn, 1992; Hoerner, 1991c); some did not (Welford & Akers, 1992; Wimmer, 1992). This is one of the few instances of a contrary view in Tech Prep. (Other contrary views are discussed later under a separate heading.) In addition to employer involvement in curriculum development, Dornsife (1992) encouraged employer involvement in helping to develop new courses and revise existing curriculum. Dornsife also stressed employer participation and involvement in Tech Prep Executive, Administrative, Coordinating, Curriculum Development, Marketing, and Program Improvement Committees. Others including Dunn (1992), Hull & Parnell (1991), Kennedy (1993), and Marsalis (1991) recommended business and industry participation and involvement in various Tech Prep committees.

In The Work Incentive Model for Tech Prep, Hoerner (1991c) included curriculum development as well as other ways that B-I-E involvement occurs, such as:

1. Advisory committees;
2. In-service professional development for secondary and postsecondary faculty, counselors and administrators;
3. Recruitment and placement activities;
4. Work incentives through real-world employment experiences such as: Cooperative Programs (Coops), On-the-Job Training (OJT) Programs, Apprenticeships, Internships, and Mentorships;

5. Program promotion;
6. Award recognition;
7. Career information;
8. Speakers' bureaus;
9. Applied math and science;
10. Student support for college costs and tuition; and
11. Contracts to motivate students to complete Tech Prep programs (p. 5).

The Roanoke Area Tech Prep Consortium completed a comprehensive survey of 670 employers in the Roanoke area and compiled a list of B-I-E methods for involvement in Tech Prep in community colleges and secondary schools in September of 1992 (Roanoke Area Tech Prep Consortium, 1992). According to the Consortium, business cooperation with education is essential for a successful Tech Prep program. Methods for involvement included the following: field trips, speakers, job fairs, work-a-day programs, mentorships, consultations, business-industry-educator exchanges, assisting teachers with course development, apprenticeships, part-time work positions, coops, in-house training programs, business-school partnerships, videos about company products, workshops, forums, work-based learning experiences, internships, and job shadowing. One of the focal points of the survey results was that Tech Prep

partnerships promote and strengthen B-I-E involvement in community colleges and secondary schools.

In a follow up interview with Julia Akers, Tech Prep Coordinator for the Roanoke Area Consortium, Akers mentioned several important methods for B-I-E involvement including: Advisory Board participation, advocates for Tech Prep, help in developing task competencies for curriculum, educators in the workforce, and job fairs (1993, February 8). Since the ultimate goal of Tech Prep for students includes entry into the workforce, the next section will highlight how Tech Prep promotes workforce development through B-I-E involvement.

Workforce Development

The idea that high skill jobs in the future will require more than a high school diploma and less than a four-year degree can be traced back to the Smith Hughes Act of 1918. This Act promoted the importance of vocational education for the world of work. Since this Act, other efforts and educational reform movements, including articulation and applied academics, have stressed the importance of vocational education in today's workforce. Tech Prep is one of the latest educational reform movements, in a long series of movements, which encourages a two-year degree or certificate in a technical field which leads to employment.

Several states focused on workforce development through task forces which promote Tech Prep programs through B-I-E involvement. This involvement culminated in providing jobs and promoting overall economic development. The states of Illinois (Illinois University, 1989), Oregon (Portland Area Vocational-Technical Education Consortium, 1990), and Wisconsin (Wisconsin University, 1991) endorsed Tech Prep programs with B-I-E involvement for building the future, high-skilled workforce necessary to compete in the global economy.

Most states and U.S. territories promote economic development, job skills, and workforce preparation through B-I-E involvement. The William T. Grant Foundation (1991) completed a comprehensive report identifying the most promising and innovative responses to employment-related educational reform through Tech Prep programs. A majority of the states was included in this detailed report.

Many states and territories look to Tech Prep, vocational-technical education, and B-I-E involvement to help prepare the future workforce with skills for tomorrow's job opportunities. For example, North Carolina's community colleges were directly involved in workforce preparation and economic development through Tech Prep programs (North Carolina State Board of Community Colleges, 1990). Texas (Texas Higher Education Coordinating Board, Community

Colleges and Technical Institutes Division, 1991) viewed its ultimate goal as enhancing Texas economic development and competing in a global economy. Through a multi-agency partnership of parents, community leaders, business and industry managers, and Tech-Prep Applied Technology Programs, Texas planned to accomplish its goal of workforce development for local economic development and global competitiveness.

Systemic changes brought about through Tech Prep programs encourage better school-to-work transitions allowing for improved workforce development (Brand, 1990c; Warnat, 1991). The Center for Occupational Research and Development (CORD, 1991) and the William T. Grant Foundation Commission on Work, Family, and Citizenship (1988, 1991) stressed the importance of the Perkins Act in providing opportunities to create educational reform through B-I-E involvement for a restructured, world-class workforce. Mensel (1989) emphasized the importance of Tech Prep through B-I-E involvement in preparing a world-class workforce.

Earlier, Naisbitt and Aburdene (1985) mentioned that community colleges are overcoming their image of glorified high schools and are becoming leaders in preparing students for the high tech economy and changing workforce. Tech Prep put community colleges in the forefront of workforce development and Perkins put B-I-E involvement into the

process. Hirshberg (1991) and McKenna (1991) highlighted the importance of the Perkins Act, Tech Prep, B-I-E partnerships, community colleges, and secondary schools in developing a world-class workforce.

Through Tech Prep programs, community colleges, secondary schools, businesses, and industries play an important part in helping students develop necessary skills to meet workforce needs of the future. Tech Prep programs provide structure, community colleges provide advanced skills, secondary schools provide foundation skills, and business-industry provide jobs. The combination of structure, advanced skills, foundation skills, and jobs enables the United States to be competitive at home and abroad. Community colleges and secondary schools train students in some of the fastest growing occupations through Tech Prep. These occupational fields include engineering technologies, nursing, business administration, management, marketing, distribution, data processing, production, agriculture, natural resources, law enforcement, security services, accounting, computers, and information sciences (Baxter, 1991). Carnes (1991) recommended close cooperation and communication among B-I-E to reach consensus on workplace skills, job duties, and staff training in community colleges and secondary schools.

Several pilot worksite-based projects funded by the Department of Labor and the National Alliance of Business focus on B-I-E involvement, Tech Prep, community colleges, and secondary schools. The main objective is to provide specific career opportunities to meet present and future workforce needs. Some career opportunities include:

- * automated manufacturing technology in Virginia;
- * community-corporation linkages in Chicago and San Francisco;
- * health care careers in Massachusetts;
- * manufacturing technology in Maryland;
- * metalworking careers in Pennsylvania; and
- * youth academies in California (Models That Link School and Work, 1991; Roanoke City Public Schools, 1990).

Tech Prep fills a need for America's workers by providing a critical link between school and work.

Community college Tech Prep programs provide higher level skills for higher skilled occupations (Hemmings, 1991).

Businesses and industries provide opportunities for students to use those skills. If the United States is to regain its competitive edge, secondary schools and community colleges must better prepare students, and business/industry must be part of the team (O'Neil, 1992). While needs of employers have changed rapidly over the last decade, educational training to meet those needs has not changed as rapidly.

With the need for high skill workers, B-I-E can form a real union to meet those needs through Tech Prep programs (Walters, 1992). Business and industry need to take a leadership role in Tech Prep. While the Perkins Act opens the door, Tech Prep provides the opportunity (Gray, 1993).

The advocacy literature is very clear on the importance of B-I-E involvement in Tech Prep programs. The Perkins Act provides incentives for business and industry participation through consultation and partnerships with secondary schools and community colleges. As mentioned earlier, special consideration is given to funding applications with B-I-E involvement. While there is implicit agreement, that is, there is little or no disagreement on most methods of involvement which are mentioned in the literature, there are a few exceptions or contrary viewpoints. The next section explores these viewpoints.

Contrary Views

While B-I-E involvement in Tech Prep programs in community colleges and secondary schools is important, not all authors agree on the importance of some methods of involvement. For example, DiPietro (1991), Dornsife (1992), Dunn (1992), and Hoerner (1991c) favored employer involvement in curriculum development; Welford and Akers (1992), and Wimmer (1992) did not. Some business executives

felt that the best way for business to improve schools is to stick to its areas of expertise, such as sharing management concepts with school leaders and avoiding forcing its curriculum ideas on schools (Businesses Must Not Force Ideas on Schools, Executives Say 1992).

Throughout the literature, there was a focus on the importance of workforce development in Tech Prep programs. Many occupational fields are included in Tech Prep such as: engineering technologies, nursing, business administration, management, marketing, distribution, data processing, production, agriculture, natural resources, law enforcement, security services, automotive technology, welding, electronic technicians, accounting, computers, and information sciences. When workplace skills were mentioned, the usual descriptive phrase is higher skills which are needed to compete in the global economy.

In addition to higher skills required by the particular occupation, other skills taught by community colleges and secondary schools include critical thinking, communications, and problem solving. The importance of B-I-E involvement in Tech Prep programs to help attain these skills is often mentioned. However, Bryant (1992) did not feel that all vocational-occupational programs should be articulated into Tech Prep. He stated that lower skills involving trades should be articulated into what he terms "Occu-Prep."

With numerous references to the importance of B-I-E involvement, Wentling's (1990, 1991) evaluations of Tech Prep programs at five sites in Indiana were quite revealing. In the first pilot test, school years 1989-1990, Wentling provided a description of Tech Prep programs and the effectiveness of their implementation. In the second pilot test, school years 1990-1991, Wentling discovered that the majority of business-industry respondents were neither aware of nor involved with Tech Prep. Similarly, Miguel (1990) discovered that only 20% of school board members in Illinois were aware of Tech Prep programs in their state. However, most board members were aware of efforts to integrate vocational and academic education, and placed a high value on employability skills and educational participation in the business community.

Since the general purpose of this study was to document B-I-E involvement in Tech Prep programs in Virginia's community colleges and secondary schools, Wentling's and Miguel's findings are both important and significant. It is one thing to advocate B-I-E involvement and quite another to find out whether or not they are really involved.

The Commission on the Skills of the American Workforce (1990) provided a somber choice: High Skills or Low Wages. Tech Prep programs are designed to provide skills and competencies leading to employment opportunities in

technologically advanced workforce careers. These careers should command higher salaries. However, Huang & Gray (1992) claimed that postsecondary education of only two years, including Tech Prep, does not pay off in higher wages; whereas, a four-year degree does.

Chapter Summary

This chapter reviewed the literature and research dealing with the foundations of Tech Prep programs; definitions of Tech Prep and the Perkins Act; importance of B-I-E involvement; workforce development; and contrary views.

The foundations of Tech Prep programs go back almost sixty-five years when a similar concept was introduced by Koos in The Junior College. Hull and Parnell have been influential in bringing Tech Prep to the forefront in educational reform. Parnell's 1984 and 1985 concept papers advocated the development of a 2 + 2 Tech Prep/Associate Degree program to provide access to a mid-level range of career choices. Parnell's The Neglected Majority (1985) encouraged bringing the "forgotten half" that is, the 50-60% of high school students who are in the "general track", into a career track. The concept papers and the book led to the

first complete treatment of Tech Prep in Hull & Parnell's Tech Prep Associate Degree: A Win/Win Experience, (1991).

The literature suggested that there is no common definition for Tech Prep. While many states have their own definitions, there was no overall agreed upon definition. The Perkins Act definition was the one most referred to and used. The literature strongly encouraged and supported B-I-E involvement in Tech Prep programs in community colleges and secondary schools as essential for program development and success. The Perkins Act gave special consideration to applications for grants which are developed in consultation with business, industry, and labor unions.

Several states focused on workforce development through task forces which promote Tech Prep programs through B-I-E involvement in community colleges and secondary schools. Tech Prep places community colleges in the forefront of workforce development and the Perkins Act places B-I-E involvement in the process. Since one of the ultimate goals of the Perkins Act is to provide productive employment, workforce development becomes a key component in Tech Prep.

While B-I-E involvement in Tech Prep programs is important, not all authors agreed on particular methods for involvement. For example, curriculum development is one issue that has opposing viewpoints. Another is that not all vocational-occupational programs should be articulated into

Tech Prep. A third is that while B-I-E partnerships are considered important, many businesses and industries were neither aware nor involved with Tech Prep. A final one is that Tech Prep graduates may not necessarily earn higher wages.

The literature review identified 65 methods of B-I-E involvement which were grouped in seven cluster areas and incorporated in the survey instrument (Questionnaire in Appendix A). The researcher drew upon the writings of the following authors, who were particularly helpful in listing methods of involvement used in the survey instrument: Akers, 1993; DiPietro, 1991; Dornsife, 1992; Dunn, 1992; Hata, 1990; Hoerner, 1991c; Hoerner & Clowes, 1992; Hoke & Suba, 1992; Hull & Parnell, 1991; Kennedy, 1993; Key, 1992; Marsalis, 1991; Rice, 1991; and the Roanoke Area Tech Prep Consortium, 1992. As an example, the Roanoke Area Tech Prep Consortium determined that job fairs were a B-I-E method of involvement in Tech Prep programs. In the survey instrument (see Appendix A), item (question) 59 asked, "Does B/I participate in job fairs?" In a similar manner, other items which were identified in the review of the literature and research became part of the survey instrument. The next chapter describes the research design and methodology used for analyzing the 65 methods of involvement.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

The Perkins Act provides funds for Tech Prep programs and gives special consideration to applications for funds which are developed in consultation with business and industry. Identifying, classifying, and documenting business-industry-education (B-I-E) involvement in Tech Prep programs in Virginia's community colleges and secondary schools was an important part of this research. The literature review strongly suggested that B-I-E involvement is a vital component of Tech Prep program development.

The related literature review and research identified many articles, books, documents, proceedings, and surveys regarding B-I-E partnerships (involvement) in general. There are several terms used to describe partnerships such as: connections, participation, commitment, and involvement. Methods of B-I-E involvement in Tech Prep programs in community colleges and secondary schools were gleaned from the related literature and research. This study identified 65 methods of B-I-E involvement.

The purpose of this section of the research is to formulate a framework for identifying, classifying, and documenting B-I-E methods of involvement in Tech Prep

programs in Virginia's community colleges and secondary schools. This section contains information about the population and sample, research design, instrumentation (questionnaire), data collection procedures, data analysis, and a chapter summary.

Population and Sample

At the time of this study, there were 44 Tech Prep projects in Virginia. Each Tech Prep project had at least one key person at the community college and at least one key person at the secondary schools in the community college service area. The population consisted of at least 88 key persons, with the unit of analysis being a Tech Prep project.

There were 32 consortia in Virginia at the time of this study. Each community college constituted a Tech Prep consortium, along with its respective secondary schools. There are 23 community colleges in Virginia which means 23 consortia. (Community colleges with multi-campus locations comprise the remaining 9 consortia.) This study examined Tech Prep projects at all 23 community colleges. Since several consortia had more than one project, the 23 community college subjects and the 23 secondary school subjects were involved with 44 projects.

Each community college had at least one secondary school associated with it. (In most instances, there were several secondary schools associated with each community college.) The sample of this study consisted of 23 key persons at Virginia's community colleges, and 23 key persons at Virginia's secondary schools for a sample size of 46.

The selection of the key person at the community college was determined from a list sent to the researcher by the State Tech Prep Director. The selection of the particular secondary school key person was made through purposive sampling which intends to select those subjects who can contribute most to the research through maturity, strength, quality and/or length of program. Through purposive sampling, secondary school key persons were selected to participate in the study. The researcher either called or visited consortia members to determine appropriate secondary school key persons. This process examined Tech Prep programs (projects) in all 23 community colleges and their associated secondary schools.

Research Design

The type of research in this study is descriptive. Descriptive research involves data collection in order to answer questions concerning the current status of the sample

under investigation in the study. A descriptive study investigates and reports on the way things are (Gay,1992). Descriptive research describes the way things presently exist. This type of study is often called "ex post facto" or "nonexperimental" (Best & Kahn, 1989). According to Poister (1978), descriptive research is the most efficient. It is also the most manageable of research designs because it does not require the researcher to inhibit or interfere with the operation of the program or process.

Although descriptive research sounds simple, there is more to it than just asking questions and reporting answers. Once the problem is defined, the population and/or sample was selected. The type of descriptive research in this study involved self-report research using a questionnaire as the main tool or instrument.

In this study, purposive sampling was selected in order to ensure receiving responses from projects which were currently active and underway. Without purposive sampling, random selection may have contributed to an insufficient sample size or else a project that was so new as to be of dubious value for determining B-I-E involvement in Tech Prep programs in Virginia. Guba and Lincoln compared sampling techniques in emergent and traditional research designs. They found that "Sampling is almost never representative or

random but purposive, intended to exploit competing views and fresh perspectives as fully as possible" (1981, p. 276).

Instrumentation

A questionnaire was developed by the researcher to obtain data for this study (see Appendix A). For purposes of clarification and explanation, the questionnaire contained an Introduction, Part I, and Part II. Before the final questionnaire was composed, a draft was pilot-tested with two Tech Prep Director-Coordinationators selected from community colleges with B-I-E partnerships in order to clarify, modify, add, delete, and/or otherwise change the questionnaire to better reflect what the questionnaire should measure. The main purpose of the pilot tests was to compile a questionnaire that would measure what it was supposed to measure, that is, to achieve content validity.

The Introduction included the title of the research, an explanation of the major research focus, and an explanation of the format of the questionnaire. Part I contained 65 specific questions to solicit information about methods of involvement which the respondents used in their Tech Prep programs. For example, question nine asked, "(Does B/I) sponsor student mentorships?" Both Hoerner (1991c) and the Roanoke Area Tech Prep Consortium (1992) identified this

particular method of involvement. Other methods were added to the questionnaire in a similar manner.

Questions 66 through 70 provided blank spaces for respondents to write in other methods of involvement which were not included in questions 1 through 65. The responses of those who wrote in other methods of involvement are identified and summarized in Chapter 4. The answers to questions 1 through 65 and the written-in responses determined B-I-E methods of involvement in this study.

Part II contained questions to solicit general Tech Prep program information about respondents. Part II also contained information about characteristics of businesses and industries involved in Tech Prep programs represented by the surveyed population.

Data Collection Procedure

The questionnaire in Appendix A was mailed to 46 key persons, 23 at community colleges, and 23 at secondary schools. The questionnaire was mailed together with a specifically addressed cover letter (see Appendix B) signed by the researcher using letterhead stationery of Virginia Polytechnic Institute and State University's Division of Administrative and Educational Services. A self-addressed, stamped envelope was included with the questionnaire for its

return. Data collection for this research was begun in the Spring of 1993.

The follow-up methodology included:

- (1) after one week, the first follow-up letter was sent to everyone in the sample (see Appendix C); and
- (2) after three weeks, the second follow-up letter and replacement questionnaire were sent only to the non-respondents (see Appendix D).

To enhance the response rate, the methodology included:

- (1) an attractive questionnaire layout for ease of reading;
- (2) official Virginia Tech sponsorship using letterhead stationery of Virginia Polytechnic Institute and State University's Division of Administrative and Educational Services;
- (3) personalization of correspondence by individually signing each letter with blue ink;
- (4) the addition of a title under the sender's name;
- (5) guarantee of confidentiality; and
- (6) the cover letter's composition which included a personalized address, purpose and usefulness of the study, why it was important for the questionnaire to be completed and returned, promise of confidentiality, what to do if questions arose, an appreciation, and signature with blue ink.

To further enhance the response rate, a letter of authorization to conduct the study, signed by the Virginia Community College Assistant Chancellor for Policy Studies, was obtained. In addition, after using the routine procedures described under the follow-up and response-rate methodologies, non-responses were followed up by the researcher either in person or by telephone.

Data Analysis

Returned questionnaires were analyzed by frequency distributions, cross tabulations, means and standard deviations, and t-tests as appropriate. Dichotomous responses that required a "Yes" or "No" response were coded with a "2" for a "Yes" response and a "1" for a "No" response. The remaining data were coded for ease of interpretation.

An allowance was made for "written-in" methods of involvement with an appropriate scale of measurement. The value of written-in methods of involvement was to help other community colleges, secondary schools, and consortia members identify additional methods of involvement that they might consider using in their Tech Prep programs. In addition, an allowance was made for "written-in" business and industry characteristics.

Chapter Summary

This chapter discussed the research design and methodology. The discussion included population and sample sizes. The population was 44 key persons at community colleges and 44 key persons at secondary schools, which included the 44 Tech Prep projects in the 32 consortia in Virginia. The sample size was 46 which consisted of 23 key persons at community colleges and 23 key persons at secondary schools. The research design was a descriptive study with purposive sampling.

The instrumentation employed a survey instrument (questionnaire) for the 46 subjects. Data collection included a cover letter and questionnaire with appropriate follow-up techniques such as a first follow-up letter, second follow-up letter with questionnaire, personal follow up, and telephone follow up. Data analysis consisted of frequencies, standard deviations, means, cross tabulations, and t-tests.

CHAPTER 4

DATA ANALYSIS AND FINDINGS

This chapter gives a detailed report of what was found as a result of the analysis of the returned questionnaires. The following main points are included: (1) a description of the respondents; (2) analysis of research question one; (3) analysis of research question two; (4) analysis of research question three; and (5) a chapter summary.

A Description of the Respondents

Forty-six Tech Prep key persons (subjects) constituted the sample for this study. Twenty-three key persons were located at Virginia community colleges and 23 were located at secondary schools associated with each community college. Forty-four subjects completed and returned the questionnaire for a response rate of 96 percent.

This rate was calculated as follows:

Response rate = Number of returned questionnaires divided by
the number of questionnaires mailed.

$$96 \text{ percent} = 44/46$$

Table 1 presents a comparison of all respondents. Each item number (question) in this table corresponds to the item number on the questionnaire (see Appendix A). For item 71, 22 respondents were Tech Prep Project Key Persons from community colleges and 22 were from secondary schools. Item 72 asked respondents to list their principal job title at the community college or secondary school that they checked in item 71. See Table 2, which follows this part of the text, for actual job titles reported by respondents.

Item 73 addressed the amount of time spent on Tech Prep program activities. Thirty of 44 (68%) respondents spent 50% or less time on Tech Prep program activities; 11 were community college and 19 were secondary school respondents. Fourteen of 44 (32%) respondents spent 51% or more of their time on Tech Prep program activities; 11 were community college and 3 were secondary school respondents.

Item 74 addressed time spent on Tech Prep program activities compensated with Tech Prep funds. Thirty-six of 44 (82%) respondents were compensated for 50% or less of their time spent on Tech Prep program activities; 15 were community college and 21 were secondary school respondents. Eight of 44 (18%) were compensated for 51% or more time; 7 were community college and 1 was a secondary school respondent(s).

TABLE 1
COMPARISON OF ALL RESPONDENTS

71. I am a Tech Prep Project Key Person at a:
Community College 22 Secondary School 22

72. Please list your principal job title at the community college or secondary school that you checked above.
(See composition for community colleges/secondary schools.)

73. Approximate percent of time spent on Tech Prep program activities?

0-25%

B	C	S
<u>26</u>	10	16;

 26-50%

B	C	S
<u>4</u>	1	3;

 51-75%

B	C	S
<u>7</u>	6	1;

 76-100%

B	C	S
<u>7</u>	5	2

74. Approximate percent of time spent on Tech Prep program activities that is compensated with Tech Prep funds?

0-25%

B	C	S
<u>31</u>	12	19;

 26-50%

B	C	S
<u>5</u>	3	2;

 51-75%

B	C	S
<u>2</u>	2	0;

 76-100%

B	C	S
<u>6</u>	5	1

75. Number of Tech Prep projects that you are involved with at your institution?

1

B	C	S
<u>20</u>	11	9;

 2

B	C	S
<u>11</u>	5	6;

 3

B	C	S
<u>9</u>	4	5;

 4

B	C	S
<u>4</u>	2	2

76. How long have you been involved with Tech Prep?

0-1yr

B	C	S
<u>8</u>	5	3;

 1-2yrs

B	C	S
<u>16</u>	6	10;

 2-3yrs

B	C	S
<u>18</u>	10	8;

 +4 yrs

B	C	S
<u>2</u>	1	1

77. Which category best describes your professional education?

Acad.

B	C	S
<u>21</u>	15	6;

 Voc.

B	C	S
<u>17</u>	5	12;

 Both

B	C	S
<u>5</u>	1	4;

 Admin.

B	C	S
<u>1</u>	1	0

78. What stage of development best describes your Tech Prep program

B	C	S
<u>5</u>	2	3

 Planning Stage (establishing committees-consortium members)

B	C	S
<u>28</u>	17	11

 Developmental Stage (writing curriculum/producing marketing tools)

B	C	S
<u>9</u>	3	6

 Implementation Stage (curriculum written and student recruitment)

B	C	S
<u>2</u>	0	2

 Advanced Stage (students enrolled and/or graduating from programs)

79. Does your Tech Prep program have a job placement component?

B	C	S
<u>16</u>	9	7

 Yes

B	C	S
<u>28</u>	13	15

 No

Note. B = Both Community College and Secondary School Respondents.
C = Community College Respondents.
S = Secondary School Respondents.
Acad. = Academic; Voc. = Vocational; Admin. = Administrative.

Item 75 asked the number of Tech Prep projects with which respondents were involved at their institutions. Eleven community college respondents were involved with one project, 5 with two projects, 4 with three projects, and 2 with four projects. This yielded a coverage of 41 Tech Prep projects. Nine secondary school respondents were involved with one project, 6 with two projects, 5 with three projects, and 2 with four projects. This yielded a coverage of 44 Tech Prep projects.

Item 76 asked how many years respondents were involved with Tech Prep. Eleven of 22 community college respondents were involved with Tech Prep up to two years, and 11 were involved for over two years. Thirteen of 22 secondary school respondents were involved with Tech Prep for up to two years, and 9 were involved for over two years.

Item 77 inquired about the professional education (background) of the respondents. There was a distinct difference in professional education between community college and secondary school respondents. Fifteen community college and 6 secondary school respondents reported an academic educational background, while 5 community college and 12 secondary school respondents reported a vocational background. There was an interesting written-in response for both community college and secondary school respondents. One community college and 4 secondary school respondents

wrote that they had both an academic and a vocational educational background. In addition, 1 community college respondent wrote of having an administrative background.

Item 78 asked respondents to report on the stage of development that best describes their Tech Prep programs. Community colleges were in an earlier stage of development in their Tech Prep programs compared to secondary schools. For example, 2 community college respondents reported being in the planning stage compared to 3 secondary school respondents; 17 community college respondents reported being in the developmental stage compared to 11 secondary school respondents; 3 community college respondents reported being in the implementation stage compared to 6 secondary school respondents; and no community college respondents reported being in the advanced stage compared to 2 secondary school respondents.

Item 79 asked whether or not the Tech Prep program had a job placement component. Nine community college and 7 secondary school respondents reported having a job placement component. Thirteen community college and 15 secondary school respondents reported not having a job placement component. Appendix F summarizes the Composition of All Respondents; Appendix G summarizes the Composition of Community College Respondents; and Appendix H summarizes the Composition of Secondary School Respondents.

TABLE 2
JOB TITLES REPORTED BY RESPONDENTS

COMMUNITY COLLEGE RESPONDENTS

ADMINISTRATOR	1
CONTINUING EDUCATION DIRECTOR	2
DEAN OF INSTRUCTION	1
DIRECTOR	1
DIVISION CHAIR - BUSINESS & TECHNOLOGIES	1
DIVISION CHAIR - ENGLISH, HEALTH, MATH & SCIENCE	1
DIVISION CHAIR - SOCIAL SCIENCES	1
GUIDANCE COUNSELOR	1
PROVOST - STEERING COMMITTEE	1
TECH PREP COORDINATOR	5
TECH PREP PROJECT DIRECTOR	5
TECH PREP PROJECT DIRECTOR, ASSISTANT	1
TECH PREP PROJECT LEADER	<u>1</u>
	22

SECONDARY SCHOOL RESPONDENTS

COORDINATOR - FEDERAL PROGRAMS & COMMUNITY EDUCATION	1
DEAN OF INSTRUCTION	1
DEPARTMENT CHAIR - BUSINESS EDUCATION	1
DIRECTOR	1
DIRECTOR - VOCATIONAL EDUCATION	9
GUIDANCE COUNSELOR	1
PRINCIPAL	1
PRINCIPAL, ASSISTANT	1
SUPERINTENDENT	1
SUPERINTENDENT, ASSISTANT	1
TECH PREP COORDINATOR	1
TECH PREP DIRECTOR	1
TECH PREP FACILITATOR	1
TECH PREP HIGH SCHOOL SUPERVISOR	<u>1</u>
	22

This section described community college and secondary school respondents. Of a total of 44 respondents, 22 were associated with community colleges and 22 with secondary schools. Community college respondents spent more time and were compensated for more of their time spent on Tech Prep activities with Tech Prep funds compared to secondary school respondents. Community college respondents were involved in 41 Tech Prep projects, while secondary school respondents were involved with 44. Community college respondents were involved with Tech Prep slightly longer than their secondary school counterparts.

There was a difference in professional educational background between community college and secondary school respondents. Most (15) community college respondents reported having an academic education, while most (12) secondary school respondents reported having a vocational education. Secondary school respondents reported that their Tech Prep programs were in a later stage of development compared to their community college counterparts. Most community college and secondary school respondents reported that their Tech Prep programs did not have a job placement component.

Analysis of Research Question One

"How is the level of business-industry-education (B-I-E) involvement in Tech Prep programs in Virginia's community colleges and secondary schools alike and how is it different?"

The literature review and research identified 65 methods of B-I-E involvement which were grouped into seven cluster areas as follows:

- (1) Career Information and Guidance;
- (2) Curriculum and Instruction;
- (3) Financial Aid;
- (4) Marketing and Recruitment;
- (5) Placement and Jobs;
- (6) Planning, Development, and Evaluation; and
- (7) Resources Other Than Financial.

The 65 methods of involvement became the basis for the questionnaire (see Appendix A) which was mailed to the 46 subjects in the sample. The respondents were given an opportunity to include additional methods of involvement which were not included on the questionnaire. These are reported in questions 66-70 and summarized in the appropriate section of the text. The actual responses to the questionnaire are summarized and included in Appendix E: Questionnaire Responses.

Each cluster area is described separately in the text and tables which follow. The following key to abbreviations and symbols apply to this section.

<u>KEY</u>	<u>IDENTIFICATION</u>	<u>VALUES</u>
B/I	Business/Industry	
B	Both Community College and Secondary School Respondents	
C	Community College Respondents	1
S	Secondary School Respondents	2
U	Usually	4
O	Often	3
S	Sometimes	2
AN	Almost Never	1
Y	Yes	2
N	No	1

ABBREVIATIONS

ACAD.	Academic
ADMIN.	Administrative
COMM.	Committee
PARTIC.	Participate
PROG.	Program
VOC.	Vocational
YR.	Year
YRS.	Years

Each cluster area is presented in rank order. For each cluster area, a table shows the means for each item on the questionnaire. The items are rank ordered from highest to lowest according to the means for both community college and secondary school respondents. To help interpret the tables, a brief explanation follows.

The choices for each item (except those with a "Yes" or "No" response) were "Usually" with a weight of 4, "Often" with a weight of 3, "Sometimes" with a weight of 2, and "Almost Never" with a weight of 1. The selection of the choices above and the count for each translate into a weighted average or mean. The means allow the reader to compare the degree of B-I-E involvement as perceived and reported by community college and secondary school respondents. High means are synonymous with high involvement; low means are synonymous with low involvement.

The frequency of selection of higher values (weights) leads to higher means. Therefore, when higher means are reported, the respondents more frequently selected higher values (Usually or Often) rather than lower values (Sometimes or Almost Never).

Planning, Development and Evaluation

The first cluster area is Planning, Development and Evaluation (see Table 3). Community college respondents frequently selected B-I-E methods of involvement such as: (3) help in developing Tech Prep programs, (4) get involved in the planning stages of Tech Prep programs, (11) participate in in-service professional development, and (12) assist with student follow-up evaluations. Secondary school respondents selected all other Planning, Development and Evaluation methods of involvement more frequently.

The selection of responses by both groups resulted in high means which suggested high involvement as measured by frequency of weighted responses. Planning, Development and Evaluation was the cluster area of highest B-I-E involvement as reported by community college and secondary school respondents.

TABLE 3
PLANNING, DEVELOPMENT AND EVALUATION
MEANS

Rank			MEANS		
			C	S	B
1	How often does B/I participate on Steering Committee?	<u>N</u> = 18	3.22	15 3.53	3.36
2	How often does B/I participate on Advisory Committee?	<u>N</u> = 21	3.24	22 3.45	3.35
3	Does B/I help in developing Tech Tech Prep programs?	<u>N</u> = 22	3.50	22 3.18	3.34
4	Does B/I get involved in planning stages of Tech Prep programs?	<u>N</u> = 22	3.45	22 3.14	3.30
5	How often does B/I participate on Program Improvement Committee?	<u>N</u> = 11	3.09	10 3.30	3.19
6	How often does B/I participate on Coordinating Committee?	<u>N</u> = 21	2.94	14 3.29	3.09
7	How often does B/I participate on Executive Committee?	<u>N</u> = 15	2.67	14 3.36	3.00
8	How often does B/I participate on Staff Development Committee?	<u>N</u> = 10	2.90	9 3.11	3.00
9	Does B/I participate in business-industry-education partnerships?	<u>N</u> = 22	2.82	21 3.19	3.00
10	Does B/I get involved in implementation of programs?	<u>N</u> = 22	2.45	22 3.05	2.75
11	Does B/I participate in in-service professional development?	<u>N</u> = 22	2.59	21 2.29	2.44
12	Does B/I assist with student follow-up evaluations?	<u>N</u> = 22	2.09	21 2.05	2.07
GROUP MEANS			<u>2.91</u>	<u>3.06</u>	<u>2.99</u>

Note.

B = Both Community College and Secondary School Respondents.

C = Community College Respondents.

S = Secondary School Respondents.

N = Number of Respondents.

* = Means of Community College and Secondary School Respondents differ at $p < .05$.

Curriculum and Instruction

The second cluster area for B-I-E involvement is Curriculum and Instruction (see Table 4). Community college means are higher for the following: (3) Does B/I identify student outcomes required for current jobs; (5) Does B/I identify student outcomes required for future jobs; and (8) Does B/I help teachers develop competency-based requirements. The higher means for community college respondents in these three Curriculum and Instruction methods of involvement indicate that community college respondents reported that B/I participated more frequently in these methods than secondary school respondents reported.

The group means are 2.75 for community colleges and 2.88 for secondary schools. The higher group means for secondary schools indicate that secondary school respondents reported that B/I participated more frequently in Curriculum and Instruction methods of involvement overall.

For all seven cluster areas, Curriculum and Instruction methods of involvement are the next highest reported by both community college and secondary school respondents. The cluster area of Planning, Development, and Evaluation, which is reported later in this section, has the highest means of all areas.

TABLE 4
CURRICULUM AND INSTRUCTION
MEANS

B/I = Business and/or Industry		MEANS		
Rank		C	S	B
1	How often does B/I participate on Curriculum Committee?	3.25	3.30	3.28
2	Does B/I review curricula for job relevance?	2.46	3.19	3.10
3	Does B/I identify student outcomes required for current jobs?	3.14	3.00	3.07
4	Does B/I review course content for job relevance?	2.95	3.14	3.05
5	Does B/I identify student outcomes required for future jobs?	3.05	3.00	3.02
6	Does B/I help teachers in developing a curriculum?	2.95	3.05	3.00
7	Does B/I help teachers in revising existing curriculum?	2.81	3.05	2.93
8	Does B/I help teachers develop competency-based requirements?	2.90	2.76	2.83
9	Does B/I help teachers in developing new courses?	2.48	2.67	2.57
10	Does B/I assist teachers in developing specific teaching units?	2.14	2.29	2.21
11	Does B/I award credit to students for demonstrated work-based competencies?	1.95	2.19	2.07
GROUP MEANS		<u>2.75</u>	<u>2.88</u>	<u>2.83</u>

Note.

B = Both Community College and Secondary School Respondents.

C = Community College Respondents.

S = Secondary School Respondents.

N = 21 Respondents at Community Colleges and 21 at Secondary Schools.

* = Means of Community College and Secondary School Respondents differ at $p < .05$.

Marketing and Recruitment

The next cluster area is Marketing and Recruitment (see Table 5). Community college means are higher than secondary school means for B/I participation as advocates for Tech Prep and as members of Marketing Committees. The secondary school mean is higher for recruitment activities.

Although community college means are higher for two of three questions in Marketing and Recruitment, overall group means for secondary schools are 2.79 compared to 2.69 for community colleges. This indicates that secondary school respondents reported that B/I were more involved in Marketing and Recruitment methods than community college respondents reported.

The means for Marketing and Recruitment methods of involvement are the closest means between community colleges and secondary schools for all seven cluster areas. This indicates the cluster area of least difference between community college and secondary school respondents (see Figure 1).

TABLE 5
MARKETING AND RECRUITMENT
MEANS

B/I = Business and/or Industry		MEANS		
Rank		C	S	B
1	Does B/I serve as advocates for Tech Prep? <u>N</u> for C = 21; <u>N</u> for S = 22.	3.10	3.09	3.09
2	How often does B/I participate as members of Marketing Committee? <u>N</u> for C = 17; <u>N</u> for S = 16.	3.06	3.00	3.03
3	Does B/I participate in recruitment activities? <u>N</u> for C = 21; <u>N</u> for S = 22.	1.95	2.32	2.14
GROUP MEANS		<u>2.69</u>	<u>2.79</u>	<u>2.75</u>

Note.

B = Both Community College and Secondary School Respondents.

C = Community College Respondents.

S = Secondary School Respondents.

N = Number of Respondents.

* = Means of Community College and Secondary School Respondents differ at $p < .05$.

Resources Other Than Financial

The next cluster area is Resources Other Than Financial (see Table 6). Both community college and secondary school respondents frequently selected "Almost Never" for providing teacher awards. This resulted in the lowest means (1.65) of all B-I-E methods of involvement, that is, for all 65 methods of involvement that are in the questionnaire. [Sponsoring apprenticeships (1.76) and providing financial support (1.79) were the next lowest.]

The means for both community college and secondary school respondents indicate that B/I participated most frequently in the following: (1) provide career-day speakers, (2) participate in job fairs, (3) provide classroom speakers, (4) allow for adult retraining, and (5) participate in workshops/forums. The group mean (2.64) for secondary school respondents is higher than the group mean (2.39) for community college respondents, indicating that secondary school respondents reported that B/I participated to a greater extent in providing Resources Other Than Financial compared to community college respondents.

TABLE 6
RESOURCES OTHER THAN FINANCIAL
MEANS

Rank			MEANS		
			C	S	B
1	Does B/I provide career-day speakers?	<u>N</u> = 22	3.09	22 3.59	3.34*
2	Does B/I participate in job fairs?	<u>N</u> = 22	3.18	22 3.45	3.32
3	Does B/I provide classroom speakers?	<u>N</u> = 22	2.95	22 3.45	3.20*
4	Does B/I allow for adult retraining?	<u>N</u> = 21	3.05	22 2.64	2.84
5	Does B/I participate in workshops/forums?	<u>N</u> = 22	2.41	22 3.00	2.70*
6	Does B/I allow their company personnel to teach in schools?	<u>N</u> = 21	2.38	22 2.27	2.33
7	Does B/I participate in adopt-a-school programs?	<u>N</u> = 21	2.24	22 2.36	2.30
8	Does B/I participate in business-industry-educator exchanges?	<u>N</u> = 21	2.14	22 2.18	2.16
9	Does B/I provide space for classes?	<u>N</u> = 21	1.81	22 2.09	1.95
10	Does B/I participate in work-a-day programs?	<u>N</u> = 21	1.52	22 2.23	1.88*
11	Does B/I provide teacher awards?	<u>N</u> = 21	1.48	22 1.82	1.65
GROUP MEANS			<u>2.39</u>	<u>2.64</u>	<u>2.52</u>

Note.

B = Both Community College and Secondary School Respondents.

C = Community College Respondents.

S = Secondary School Respondents.

N = Number of Respondents.

* = Means of Community College and Secondary School Respondents differ at $p < .05$.

Career Information and Guidance

Table 7 reports Career Information and Guidance means. The means for secondary school respondents are higher than the means for community college respondents for all questions pertaining to B-I-E involvement in Career Information and Guidance. The higher means for secondary school respondents indicate that they selected "Usually" and "Often" more frequently than their community college counterparts. Higher involvement results in higher means.

Consequently, secondary school respondents reported that business and industry participated in Career Information and Guidance methods of involvement more frequently than community college respondents.

There is a significant difference between community college and secondary school respondents for 3 of 10 items: (1) Provide speakers for business-industry-education days; (6) Arrange for student plant tours; and (10) Offer videos about company products and services.

TABLE 7
CAREER INFORMATION AND GUIDANCE
MEANS

B/I = Business and/or Industry		MEANS		
Rank		C	S	B
1	Provide speakers for business-industry-education days?	2.76	3.43	3.10*
2	Conduct exploratory/career awareness opportunities?	2.48	2.81	2.64
3	Provide individual student consultation/counseling?	2.33	2.76	2.55
4	Sponsor student field trips?	2.38	2.71	2.55
5	Participate in work-based learning experiences?	2.14	2.67	2.40
6	Arrange for student plant tours?	2.00	2.57	2.29*
7	Help with student needs assessments?	2.00	2.48	2.24
8	Sponsor student mentorships?	1.90	2.14	2.02
9	Conduct in-house (plant or B/I site) training programs?	1.86	2.10	1.98
10	Offer videos about company products and services?	1.52	2.14	1.83*
GROUP MEANS		<u>2.14</u>	<u>2.58</u>	<u>2.36</u>

Note.

B = Both Community College and Secondary School Respondents.

C = Community College Respondents.

S = Secondary School Respondents.

N = 21 Respondents at Community Colleges and 21 at Secondary Schools.

* = Means of Community College and Secondary School Respondents differ at $p < .05$.

Placement and Jobs

The next cluster area is Placement and Jobs (see Table 8). Means for secondary school respondents are higher than the means for community college respondents for all questions pertaining to Placement and Jobs. The higher means for secondary school respondents indicate that they selected "Usually" and "Often" more frequently than their community college counterparts.

Table 8 indicates that secondary school respondents reported that B/I were more involved in Placement and Jobs B-I-E methods of involvement than their community college counterparts.

There is a significant difference between community college and secondary school respondents for 3 of 5 items: (1) Sponsor student coop programs; (2) Offer student on-the-job training; and (3) Participate in student placement activities.

TABLE 8
PLACEMENT AND JOBS
MEANS

Rank		MEANS		
		C	S	B
1	Sponsor student coop programs?	2.38	3.05	2.71*
2	Offer student on-the-job training?	2.14	2.81	2.48*
3	Participate in student placement activities?	1.86	2.57	2.21*
4	Provide student internships?	1.95	2.19	2.07
5	Sponsor student apprenticeship programs?	1.57	1.95	1.76
GROUP MEANS		<u>1.98</u>	<u>2.51</u>	<u>2.25</u>

Note.

B = Both Community College and Secondary School Respondents.

C = Community College Respondents.

S = Secondary School Respondents.

N = 21 Respondents at Community Colleges and 21 at Secondary Schools.

* = Means of Community College and Secondary School Respondents differ at $p < .05$.

Financial Aid

The last cluster area is Financial Aid (see Table 9). Community college and secondary school respondents reported that B/I did not provide student scholarships, equipment to schools, or financial support with high frequency. Both reported that B/I did slightly better for sponsoring part-time yearly and summer employment for students. Most respondents selected "Sometimes" and "Almost Never" for Financial Aid questions.

The means for secondary respondents are higher than the means for community college respondents for all questions pertaining to Financial Aid. There is a significant difference between community college and secondary school respondents for 2 of 5 items: (2) Sponsor part-time (summer) employment for students; and (4) Provide equipment to schools.

The group means of 1.93 and 2.34 are the lowest reported. The low group means indicate that B/I did not participate frequently in Financial Aid methods of involvement according to community college and secondary school respondents.

Appendix E summarizes questionnaire responses for all 65 B-I-E methods of involvement.

TABLE 9
FINANCIAL AID
MEANS

Rank		MEANS		
		C	S	B
1	Sponsor part-time (yearly) employment for students?	2.24	2.57	2.40
2	Sponsor part-time (summer) employment for students?	2.00	2.62	2.31*
3	Provide student scholarships?	2.00	2.29	2.14
4	Provide equipment to schools?	1.76	2.33	2.05*
5	Provide financial support?	1.67	1.90	1.79
GROUP MEANS		<u>1.93</u>	<u>2.34</u>	<u>2.14</u>

Note.

B = Both Community College and Secondary School Respondents.

C = Community College Respondents.

S = Secondary School Respondents.

N = 21 Respondents at Community Colleges and 21 at Secondary Schools.

* = Means of Community College and Secondary School Respondents differ at $p < .05$.

Table 10, which follows, lists the means of combined responses by cluster area for secondary schools, community colleges, and both secondary schools and community colleges. The means are ranked from highest to lowest. The highest means for community college and secondary school respondents are in the cluster area of Planning, Development and Evaluation; the lowest are in Financial Aid. There is a significant difference between community college and secondary school group means in Career Information and Guidance, and Placement and Jobs cluster areas.

Figure 1, which follows Table 10, displays the means of combined responses for secondary schools and community colleges in alphabetical order. For each cluster area, secondary school means are higher than community college means.

Both Table 10 and Figure 1 summarize the 65 methods of B-I-E involvement by cluster area for community college and secondary school respondents. Secondary school respondents reported higher involvement as measured by higher means in all cluster areas.

TABLE 10
MEANS OF COMBINED RESPONSES BY CLUSTER AREA

<u>CLUSTER AREA</u>	<u>MEANS</u>		
	<u>S</u>	<u>C</u>	<u>B</u>
PLANNING, DEVELOPMENT & EVALUATION	3.06	2.91	2.99
CURRICULUM AND INSTRUCTION	2.88	2.75	2.83
MARKETING AND RECRUITMENT	2.79	2.69	2.75
RESOURCES OTHER THAN FINANCIAL	2.64	2.39	2.52
CAREER INFORMATION AND GUIDANCE	2.58	2.14	2.36*
PLACEMENT AND JOBS	2.51	1.98	2.25*
FINANCIAL AID	2.34	1.93	2.14
GROUP MEANS	<u>2.69</u>	<u>2.40</u>	<u>2.55</u>

Note.

B = Both Community College and Secondary School Respondents.

C = Community College Respondents.

S = Secondary School Respondents.

* = Means of Community College and Secondary School Respondents differ at $p < .05$.

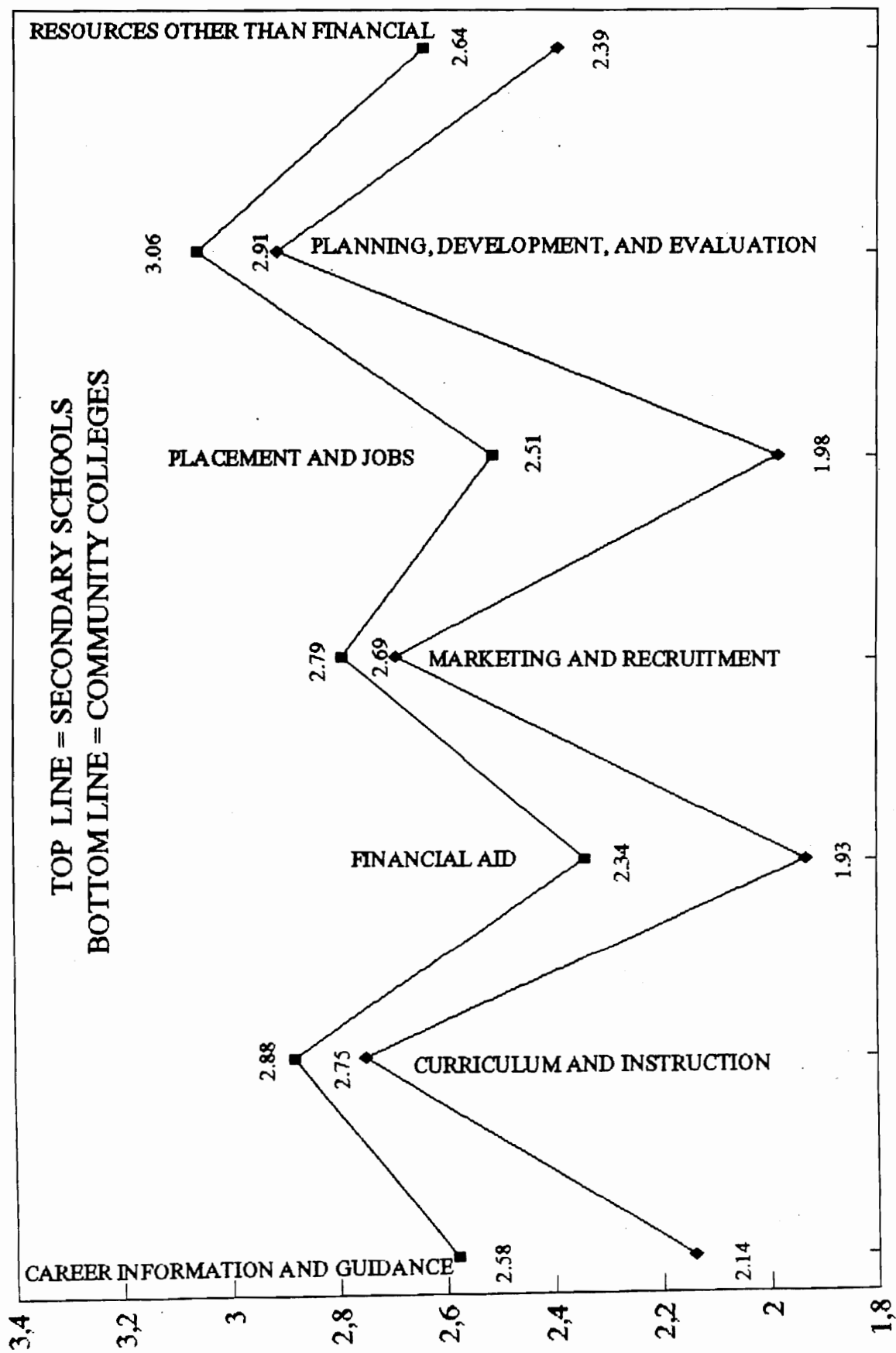


Figure 1
Comparison of Cluster Areas

Other Methods of Involvement

Items 66 through 70 on the questionnaire provided an opportunity for respondents to write in other methods of B-I-E involvement in Tech Prep programs in Virginia's community colleges and secondary schools. Both community college and secondary school respondents wrote in other methods of involvement.

Community college respondents added:

DACUM;
Evaluation and Assessment Committee;
Initial Planning and Grant Writing;
Junior Achievement;
Program Advisory Committee;
Pupil and Student Services Committee;
Small Business/Community College Scholarships;
Summer Economics Institute; and
Vocational Advisory Committee.

Secondary school respondents added:

DACUM;
Educators in the Workplace;
Survey of 670 Businesses by 60 Educators; and
Tech Prep Representatives Available to Present Tech Prep Objectives to Business and Community Groups.

Research Question One asked "How is business-industry-education involvement in Tech Prep programs in Virginia's community colleges and secondary schools alike and how is it different?" The literature review and research identified 65 methods of B-I-E involvement which were grouped in seven cluster areas.

Business-industry-education involvement in Virginia's community colleges and secondary schools was more alike than different in the areas of Curriculum and Instruction; Financial Aid; Marketing and Recruitment; Planning, Development, and Evaluation; and Resources Other Than Financial. Involvement was different for Career Information and Guidance; and Placement and Jobs according to t-tests for group means at $p < .05$.

Secondary school respondents reported higher levels of involvement as displayed by higher means in all areas. The highest level of involvement according to both community college and secondary school respondents was in Planning, Development and Evaluation. Next highest was Curriculum and Instruction; followed by Marketing and Recruitment; Resources Other Than Financial; Career Information and Guidance; and Placement and Jobs. The lowest level of involvement for both was Financial Aid.

Analysis of Research Question Two

"What are the characteristics of business and industry involved in Tech Prep programs in Virginia?"

Items 80-88 in the survey instrument (see Appendix A) consisted of 3 questions repeated 3 times in order to allow respondents to identify the characteristics of businesses and industries which participated in Tech Prep programs. This allowed for 132 possible responses for community college subjects and 132 for secondary school subjects. While 22 community college respondents answered these items, only 18 secondary school subjects answered them. There was a total possible 264 responses for both groups of subjects. The answers to questions regarding the characteristics of businesses and industries are summarized in Table 11.

Item 80 asked respondents to check either manufacturing or service. After checking either manufacturing or service, they were asked to list the product manufactured or the service provided. For example, if the business or industry manufactured items such as castings, automotive parts, mining equipment, etc., respondents were asked to list the particular product manufactured. If the business or industry was a service firm such as a health care provider,

contractor, insurance company, etc., respondents were asked to list the particular type of service provided.

For both community college and secondary school respondents, 58 of 102 responses (57%) indicated that the primary business-industry was manufacturing as opposed to service. Of the 58 responses, 35 were community college and 23 were secondary school responses. Forty-four of 102 responses (43%) indicated that the primary business-industry was service. Of the 44 responses reporting the primary business-industry as service, 22 were community college and 22 were secondary school responses.

Item 81 asked the respondents to list the size of business-industry by number of employees which included ranges from 1 to 49, 50 to 99, 100 to 199, and 200 plus. The majority of the responses (53%) indicated that the business-industry was in the 200 plus range. The next frequently reported range was 1 to 49 (25%), followed by 100 to 199 (12%), and 50 to 99 (10%).

Item 82 asked whether the business-industry was profit or non profit. The majority of responses, 94 of 102 (92%), indicated that the business-industry was for profit. Fifty-three community college responses and 41 secondary school responses indicated that the business-industry was for profit.

TABLE 11
CHARACTERISTICS of BUSINESSES and INDUSTRIES
NUMBER and PERCENT by RESPONSES

The primary business-industry that I am involved with in Tech Prep.

	COMMUNITY COLLEGES		SECONDARY SCHOOLS		BOTH	
	NO.	%	NO.	%	NO.	%
Manufacturing	35	61	23	51	58	57
Service	22	39	22	49	44	43
ACTUAL RESPONSES	57	100	45	100	102	100
POSSIBLE RESPONSES	132		132		264	

Size of business in above question by number of employees.

	COMMUNITY COLLEGES		SECONDARY SCHOOLS		BOTH	
	NO.	%	NO.	%	NO.	%
1 to 49	11	19	15	33	26	25
50 to 99	6	11	4	9	10	10
100 to 199	7	12	5	11	12	12
200 and up	33	58	21	47	54	53
ACTUAL RESPONSES	57	100	45	100	102	100
POSSIBLE RESPONSES	132		132		264	

Type of business in above question.

	COMMUNITY COLLEGES		SECONDARY SCHOOLS		BOTH	
	NO.	%	NO.	%	NO.	%
Profit	53	93	41	91	94	92
Non Profit	4	7	4	9	8	8
ACTUAL RESPONSES	57	100	45	100	102	100
POSSIBLE RESPONSES	132		132		264	

Note. N = 22 for Community College Respondents.
N = 18 for Secondary School Respondents.

The following two pages summarize products manufactured and services provided as written in by respondents. Both community college and secondary school respondents reported that the primary business-industry with which they were involved was manufacturing as opposed to service. Service, however, played an important role.

Products manufactured and services provided were similar for community college and secondary school respondents. Some of the similarities for manufactured products included automotive parts, electronic parts, furniture, heaters, mining, paper, pharmaceuticals, plastics, and shipyards. Some of the similarities for services provided included engineering, food service-processing, government, hospital-health care, and railroads.

The majority of the respondents reported that the business-industry was large, that is, 200 plus employees. The overwhelming majority of respondents reported that the business-industry was for profit as opposed to non profit.

For community college respondents, the products manufactured or services provided, along with the number of times selected are listed below:

PRODUCT	SELECTED	SERVICE	SELECTED
Automotive Parts	3	Architects	1
Chemicals	1	Automotive	1
Electronic Parts	3	Aviation	1
Fiber	1	Electronics	1
Furniture	2	Engineering	1
Heaters	1	Food Service	1
Lumber	1	Government	1
Machine Tools	1	Hospital	4
Mining	2	Insurance	2
Mining Equipment	1	Motel	1
Paper	2	Newspaper	1
Pharmaceuticals	1	Railroad	1
Plastics	1	Retail	2
Printing	1	Telephone	1
Propellants	1	University	1
Shipyard	2	Utility	2
Textiles	2	Welding	<u>1</u>
Tobacco	<u>1</u>	TOTAL	23
TOTAL	27		

For secondary school respondents, the products manufactured or services provided, along with the number of times selected are listed below:

PRODUCT	SELECTED	SERVICE	SELECTED
Automotive Parts	1	Consulting	1
Beer	1	Education	1
Bottle Caps	1	Engineering	3
Electronic Parts	1	Food Processing	1
Furniture	1	Government	1
Glad Lock Bags	1	Health Care	6
Heaters	1	Partnership Found.	1
Mining	2	Railroad	1
Mufflers	1	Training	<u>1</u>
Natural Resources	1	TOTAL	16
Paper	1		
Pharmaceuticals	1		
Plastic Signs	1		
Poultry	1		
Shipyard	1		
Transformers	<u>1</u>	TOTAL	17

The products manufactured or services provided are reported as they were written on the survey instrument. A few respondents listed brand names, but these were omitted due to confidentiality. The item that is reported most frequently by respondents is hospital and health care.

Analysis of Research Question Three

"What is the relationship between business-industry-education involvement in Tech Prep programs in general, compared with Tech Prep programs in Virginia?"

A national study by Hoerner and Clowes (1992) discovered that 200 institutions reported having 238 Tech Prep programs. Of the 238 Tech Prep programs, 190 (80%) had some kind of employer involvement such as: curriculum development, advisory committees, co-op programs, on-the-job training, apprenticeships, internships, and mentorships. In this study, all 44 respondents indicated that their Tech Prep programs had some kind of employer involvement.

Two studies in Virginia reported on employer involvement in Tech Prep programs. The first study conducted in the spring of 1992, A Report From The Virginia Council on Vocational Education (1992, October), focused on the level of involvement of representatives from business, industry and labor in Tech Prep projects. The study concluded that "there is abundant evidence of concerted involvement of businesses and industries in the areas surveyed. However, a general weakness is observed in the area of labor involvement, with participation at a minimum in contrast to business and industry representation" (1992,

p. 3). This study identified some methods of involvement such as: technical advisors, speakers, DACUM panel members, and to a lesser degree funding, equipment, publications, and facilities.

The second study in the summer of 1992, Summary of 670 Visits with Roanoke, VA Employers (1992, September), by the Roanoke Area Tech Prep Consortium focused on what the employment picture was like then and what it is expected to be like between 1990 and 2000. Key questions related to Tech Prep included the importance of B-I-E involvement and agreement with the Tech Prep concept. As a result of a follow-up survey with selected employers, 249 strongly agreed and 33 agreed that B-I-E involvement was important. Of the 282 employers, 150 strongly agreed, 122 agreed, 2 disagreed, and 1 strongly disagreed with the Tech Prep concept. Seven had no comment.

This second study identified several methods of B-I-E involvement such as: field trips, classroom and career-day speakers, participation in job fairs and work-a-day programs, mentorships, consultation, business/industry educator exchanges, apprenticeships, summer and yearly employment for high school students, in-house training programs, business-school partnerships, videos about company products, and participation in workshops and forums.

TABLE 12
MEANS OF COMBINED RESPONSES

CLUSTER AREA	MEAN
PLANNING, DEVELOPMENT & EVALUATION	2.99
CURRICULUM & INSTRUCTION	2.83
MARKETING & RECRUITMENT	2.75
RESOURCES OTHER THAN FINANCIAL	2.52
CAREER INFORMATION & GUIDANCE	2.36
PLACEMENT & JOBS	2.25
FINANCIAL AID	2.14

In order to determine the relationship between B-I-E involvement in Tech Prep programs in general, compared with Tech Prep programs in Virginia, one could evaluate the means of the responses for each of the seven cluster areas. A mean of 2.50 or greater would indicate more frequent involvement by business-industry. The means of the combined responses are shown in Table 12. The means for four areas: Curriculum & Instruction; Marketing & Recruitment; Planning, Development & Evaluation; and Resources Other Than Financial are greater than 2.50. Career Information & Guidance, Financial Aid, and Placement & Jobs have means lower than 2.50.

Another key indication of Virginia's favorable B-I-E involvement are individual means for each of the items in the cluster areas. For instance, in Planning, Development and Evaluation (see Table 3) the means are greater than 2.50 for 10 of 12 questions. In Curriculum and Instruction (see Table 4) the means are greater than 2.50 for 9 of 11 questions. For Marketing & Recruitment (see Table 5) the means are greater than 2.50 for 2 of 3 questions. For Resources Other Than Financial (see Table 6) the means are greater than 2.50 for 5 of 11 questions. In Career Information & Guidance (see Table 7) the means are lower than 2.50 for 6 of 10 questions. For Placement & Jobs (see Table 8) the means are lower than 2.50 for 4 of 5 questions. Finally, for Financial Aid (see Table 9) the means are lower than 2.50 for all 5 questions.

On average, B-I-E methods of involvement in Tech Prep programs in Virginia's community colleges and secondary schools compare favorably with business-industry-education methods of involvement in general.

Chapter Summary

A Description of the Respondents

Twenty-two respondents were associated with community colleges and 22 with secondary schools. Community college

respondents spent more time and were compensated for more of their time compared to secondary school respondents.

Community college and secondary respondents were involved in approximately the same number of Tech Prep projects at their respective institutions. Community college respondents were involved with Tech Prep slightly longer than their secondary school counterparts.

There was a difference in professional educational background between community college and secondary school respondents. Most community college respondents had an academic background while most secondary school respondents had a vocational background. Secondary school respondents were in a more advanced stage of Tech Prep program development compared to community college counterparts.

Summary of Research Question One

"How is the level of B-I-E involvement in Tech Prep programs in Virginia's community colleges and secondary schools alike and how is it different?" B-I-E involvement in Virginia's community colleges and secondary schools was more alike than different in the areas of Curriculum and Instruction; Financial Aid; Marketing and Recruitment; Planning, Development, and Evaluation; and Resources Other Than Financial. Involvement was different for Career Information and Guidance; and Placement and Jobs.

Secondary school respondents reported higher levels of involvement in all areas.

Summary of Research Question Two

"What are the characteristics of business and industry involved in Tech Prep programs in Virginia?" Community college and secondary school respondents reported that the primary business-industry that they were involved with was manufacturing as opposed to service. Service, however, played an important role. The majority of the respondents reported that the business-industry was large, that is, 200 plus employees. The overwhelming majority of respondents reported that the business-industry was for profit as opposed to non profit. Products manufactured and services provided were similar for community college and secondary school respondents.

Summary of Research Question Three

"What is the relationship between business-industry-education involvement in Tech Prep programs in general, compared with Tech Prep programs in Virginia?" A national study included some methods of B-I-E involvement. The community college and secondary school respondents included these, plus many more, in their responses to the questionnaire in this study. In addition, two Virginia

studies about B-I-E involvement in Tech Prep programs in Virginia confirmed that business-industry were actively involved. All of the methods of involvement in the above studies were included in the questionnaire in this study. The respondents in this study reported high B-I-E methods of involvement to the questions on the survey instrument.

The means of the combined responses, that is, community college and secondary school respondents for the seven cluster areas are shown in Table 10. The means for four of the seven areas, including Planning, Development, and Evaluation; Curriculum and Instruction; Marketing and Recruitment; and Resources Other Than Financial, were higher than 2.50 (the midpoint or median). The means for Career Information and Guidance; Placement and Jobs; and Financial Aid were lower than 2.50. On average, the data suggested that B-I-E methods of involvement in Tech Prep programs in Virginia's community colleges and secondary schools compared favorably with B-I-E methods of involvement in Tech Prep programs in general, that is, in other parts of the country.

CHAPTER 5

SUMMARY, DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

The preceding chapters of this study presented the research problem, reviewed the available literature and research regarding business-industry-education (B-I-E) involvement in Tech Prep programs, described the research design and methodology, analyzed the data, and reported the findings. This chapter summarizes the study, gives a brief discussion, and presents conclusions and recommendations in order to continue the thrust for examining B-I-E methods of involvement in Tech Prep programs.

Summary

This study was designed to identify, classify, and document methods for B-I-E involvement in Tech Prep programs in Virginia's community colleges and secondary schools. An extensive review of the related literature and research suggested the following:

1. The findings of the Perkins Act stressed the importance of preparing youth for the workforce through B-I-E involvement in Tech Prep programs in secondary schools and community colleges (Public Law 101-392, 1990, STAT. 789).

2. In the formative years of Tech Prep, many articles discussed and encouraged B-I-E involvement without mentioning methods of involvement (Carnes, 1991; Grover et al., 1991; Miguel, 1990; Staff, 1989, 1990).
3. As the Tech Prep movement progressed, many authors suggested methods for B-I-E involvement (Akers, 1993; DiPietro, 1991; Dornsife, 1992; Dunn, 1992; Hata, 1990; Hoerner, 1991c; Hoerner & Clowes, 1992; Hoke & Suba, 1992; Hull & Parnell, 1991; Kennedy, 1993; Key, 1992; Marsalis, 1991; Rice, 1991; Roanoke Area Tech Prep Consortium, 1992).
4. The review of the literature and research, especially the information provided by the above authors, resulted in 65 methods of involvement which became the basis for the survey instrument (see Appendix A). The 65 methods were grouped into seven cluster areas.

Problem Statement

The review of related literature and research emphasized the importance of B-I-E partnerships in developing and promoting Tech Prep programs. Partnerships, consultation, and cooperation were often used synonymously for involvement. For example, the word "partnership" frequently appeared together with "involvement" in the literature. Consequently, there was an effort by community college and secondary school educators to work together

through partnership-involvement with business and industry leaders to facilitate development and promotion of Tech Prep programs.

While there was an overt call for partnerships and consultation in the Perkins Act, methods for B-I-E involvement were left to each consortium. The procedural problem was to identify B-I-E methods of involvement in Tech Prep programs in Virginia's community colleges and secondary schools. The general purpose of the study was to identify, classify and document these B-I-E methods of involvement.

Research Questions

Specifically, the study attempted to answer the following research questions:

1. How is the level of business-industry-education (B-I-E) involvement in Tech Prep programs in Virginia's community colleges and secondary schools alike and how is it different?
2. What are the characteristics of business and industry involved in Tech Prep programs in Virginia?
3. What is the relationship between business-industry-education involvement in Tech Prep programs in general, compared with Tech Prep programs in Virginia?

Research Procedures

In order to answer the research questions, a survey of identified key persons who were involved with Tech Prep at Virginia's community colleges and secondary schools was conducted. The population of this study consisted of key persons at all 44 Tech Prep projects. The sample consisted of 23 community college subjects and 23 matching secondary school subjects in Virginia for a total sample of 46.

A questionnaire was developed by the researcher to collect the data necessary in order to answer the research questions. A draft of the questionnaire was pilot-tested with two Tech Prep Director-Coordination. One Director-Coordinator was selected from a community college and one from a secondary school with known B-I-E involvement. This enabled the researcher to clarify, modify, add, delete, and/or otherwise change the questionnaire to better reflect what the questionnaire should measure, that is, to ensure content validity. This process yielded 65 methods of involvement which became the basis for the questionnaire.

Packets containing a cover letter, a questionnaire, and stamped envelope with a return address were mailed to each of the subjects in the population. One week after the initial packet mailing, the first follow-up letter (see Appendix B) was sent reminding the participants of the importance of responding to this study. After three weeks,

the second follow-up letter and a replacement questionnaire (see Appendix C), together with another stamped envelope with a return address, were mailed to each of the non-respondents. Forty-four of the 46 subjects responded.

Data Analysis

All responses were entered into a computer with the Number Cruncher Statistical System (NCSS) software, which was utilized for the majority of the data analysis. An allowance was made for "written-in" methods of involvement and "written-in" business-industry characteristics. Descriptive statistics and appropriate measures of central tendency, frequency distributions, cross tabulations, means, and t-tests were computed to examine and analyze the data.

Findings

Research Question One: How is the level of business-industry-education (B-I-E) involvement in Tech Prep programs in Virginia's community colleges and secondary schools alike and how is it different? B-I-E involvement in Virginia's community colleges and secondary schools was more alike than different in the cluster areas of Planning, Development, and Evaluation; Curriculum and Instruction; Marketing and Recruitment; Resources Other Than Financial; and Financial Aid. Involvement was more different than alike for Career

Information and Guidance; and Placement and Jobs. Secondary school respondents reported higher levels of B-I-E involvement in all areas.

The highest level of B-I-E involvement reported by both community college and secondary school respondents was in Planning, Development and Evaluation. Next highest was Curriculum and Instruction; followed by Marketing and Recruitment; Resources Other Than Financial; Career Information and Guidance; and Placement and Jobs. The lowest level of involvement was in Financial Aid.

Research Question Two: What are the characteristics of business and industry involved in Tech Prep programs in Virginia? Community college and secondary school respondents reported that the primary business-industry with which they were involved was manufacturing (57%) as opposed to service (43%). The majority of the respondents (53%) reported that businesses and industries were large, that is, over 200 employees. The majority of respondents (92%) reported that businesses and industries were for profit.

Community college and secondary school respondents reported that businesses and industries manufactured similar products and provided similar services. Similarities for manufactured products included automotive parts, electronic parts, furniture, heaters, mining, paper, pharmaceuticals, plastics, and shipyards. Similarities for services included

engineering, food-service processing, government, hospital-health care, and railroads. Community college and secondary school respondents selected hospital-health care as the business-industry segment that participated in Tech Prep programs most frequently.

Research Question Three: What is the relationship between business-industry-education involvement in Tech Prep programs in general, compared with Tech Prep programs in Virginia? B-I-E involvement in Tech Prep programs in Virginia appeared to be as mature as any in the country. One national study by the National Center for Research in Vocational Education (NCRVE) examined 238 Tech Prep programs and found that 190 included various methods of B-I-E involvement (Hoerner & Clowes, 1992). In addition, two Virginia studies about B-I-E involvement in Tech Prep programs in Virginia confirmed that business-industry were actively involved (Roanoke Area Tech Prep Consortium, 1992; Virginia Council on Vocational Education, 1992).

All of the methods of involvement in the previous three studies were included in the questionnaire in this study. The respondents in this study reported high B-I-E involvement, as computed by high means, to the questions on the survey instrument. In addition, community college and secondary school respondents wrote-in several additional methods of involvement in their responses.

The means of the combined responses, that is, community college and secondary school respondents for the seven cluster areas are shown in Table 10. The means for four areas, including Planning, Development, and Evaluation; Curriculum and Instruction; Marketing and Recruitment; and Resources Other Than Financial, were greater than 2.50 (the midpoint or median). Career Information and Guidance, Placement and Jobs, and Financial Aid had means lower than 2.50. On average, the data suggested that B-I-E methods of involvement in Tech Prep programs in Virginia's community colleges and secondary schools compared favorably with B-I-E methods of involvement in Tech Prep programs in general.

Discussion

Prior to discussing the conclusions and making recommendations, some discussion is warranted concerning the researcher's intention in conducting this study. The literature review and research emphasized the importance of B-I-E methods for involvement in Tech Prep programs. In the formative years of Tech Prep, involvement focused on partnerships and collaboration. In time, several authors expressed involvement in terms such as: financial aid, apprenticeships, mentorships, providing equipment, making student and teacher awards, serving on various committees,

and many others. As a result of the literature review and research, 65 methods of involvement were uncovered and used as the basis for the questionnaire in this study.

The study was designed as a primary investigation to determine which of the 65 methods of involvement were used in Tech Prep programs in Virginia's community colleges and secondary schools. In addition, the study sought to provide insight as to how B-I-E involvement in Virginia's community colleges and secondary schools was alike and how was it different. Furthermore, the study attempted to uncover characteristics of businesses and industries which were involved in Virginia's Tech Prep programs. Finally, an attempt was made to find out how B-I-E involvement in Virginia's Tech Prep programs compared with Tech Prep programs in general, that is, throughout the country.

The data collected provide valuable information to those individuals interested in fostering B-I-E involvement in Tech Prep programs anywhere in the country. In addition, B-I-E methods of involvement in this study are applicable to other educational institutions such as proprietary schools, four-year colleges and universities. In fact, B-I-E methods of involvement in this study should promote "partnerships" in any business-industry-education setting. However, it was not the intent of this study to imply that the identified methods of involvement were the only suitable methods. The

intent was to provide a framework for determining any and all methods of involvement that could be used to develop and promote B-I-E involvement in Tech Prep programs anywhere in this country.

The Perkins Act encouraged active B-I-E involvement in Tech Prep programs. The literature review and research identified many methods of involvement. A recent National Assessment of Vocational Education (NAVE) study on Tech Prep programs addressed business-industry involvement. The study found that, "...business-industry get easily frustrated and feel that they are wasting time if they don't see results. It was agreed that this is an area that needs much attention and guidance" (NCRVE, 1993, p. 3). The NAVE study indicated that many businesses and industries do not get involved beyond traditional Advisory Committee participation and that there was a concern as to how to get business-industry more involved.

Conclusions

Based on the findings of this study, the following conclusions are supported:

1. The level of business-industry-education (B-I-E) involvement in Tech Prep programs in Virginia's community colleges and secondary schools is more alike than different.

In the seven cluster areas, secondary school respondents reported a higher level of B-I-E involvement than their corresponding counterparts in community colleges. Since secondary school respondents reported that they were in a later stage of Tech Prep program development, this could be the underlying reason for their being more involved.

The statistical evidence consisting of higher means for secondary school respondents across all areas support the statement that secondary schools were more involved than community colleges in B-I-E methods for involvement. Prior to this study, there was no evidence to compare community colleges and secondary schools in B-I-E methods of involvement in Tech Prep programs in Virginia.

2. Both manufacturing companies and service providers are involved in Tech Prep programs in Virginia. Of the products manufactured or services provided, health and hospital care were most often selected.

3. Large companies, those with 200 or more employees, most often participate in Tech Prep programs in Virginia.

However, most new jobs in the last decade in the United States were created by small companies, that is, those with less than 100 employees. Therefore, smaller companies must be included in Tech Prep programs.

4. The overwhelming majority of businesses and industries in Tech Prep programs in Virginia is for profit as opposed

to non-profit. Since there is a growing segment of non-profit businesses and industries in this country, this segment needs more attention.

5. B-I-E involvement in Virginia's Tech Prep programs compare favorably with B-I-E involvement in Tech Prep programs throughout the country (Hoerner & Clowes, 1992; NCRVE, 1993). The means for four of seven cluster areas of involvement were greater than 2.50 (the midpoint or median). This suggested that B-I-E involvement in Virginia's Tech Prep programs was more involved rather than less involved. In addition, the written-in responses by community college and secondary school respondents identified other methods of involvement which were not discovered in the review of related literature and research.

6. The 96% response rate indicated a willingness on the part of community college and secondary school respondents to participate in this study. Several persons requested copies of the results. The State Tech Prep Director and the Assistant Chancellor for Policy Studies in Virginia endorsed the study, and encouraged participation by the presidents in all 23 community colleges. The endorsements confirmed this state's interest in B-I-E methods of involvement in Tech Prep programs. Based on the findings of this study, Virginia appears to be in line with (if not ahead of) Tech Prep programs throughout the country.

Recommendations

To date, this study was the first to identify, classify and document B-I-E methods for involvement in Tech Prep programs in Virginia's community colleges and secondary schools. The review of the literature and research identified 65 methods of involvement. Several other methods of involvement were "written-in" on the survey instrument. Together, they provided a comprehensive identification and documentation of B-I-E methods for involvement in Tech Prep programs.

It is recommended that:

1. This study be replicated on other populations such as teachers and guidance counselors to determine whether this population, Virginia's key persons in Tech Prep programs in community colleges and secondary schools, is unique.
2. This study be duplicated next year to determine if the surveyed respondents' perceptions are similar to the data reported in this research. This would determine the degree of progress in B-I-E methods of involvement from one year to the next.
3. B-I-E methods for involvement identified in this study be adopted by other states. The researcher believes that the 65 methods of involvement used in this study, plus the additional methods written-in by the respondents, provide a

nucleus for a survey instrument that would have far-reaching applications in other locations.

4. B-I-E methods for involvement identified in this study be used in educational programs other than Tech Prep. The researcher believes that B-I-E methods for involvement in this study could be used in other programs to promote better education-to-workforce transitions.

5. B-I-E methods for involvement identified in this study be used to develop a model for promoting B-I-E methods for involvement. Educational reform movements include effective and efficient transitions for students to become highly-skilled workers. A model for B-I-E involvement would help bridge the gap from school to work.

6. This study be duplicated by surveying business-industry leaders in addition to educators. Unfortunately, this study did not include the perceptions of business-industry leaders in Tech Prep programs. Since business-industry is essential in providing jobs, B/I leaders' perceptions are important.

7. This study be duplicated among proprietary schools and other educational institutions. The Perkins Act includes proprietary schools and other institutions in Tech Prep programs. Therefore, they should be given an opportunity to participate in these programs throughout the country.

It is recommended that further research be conducted in these areas in order to develop more fully the opportunities for business, industry, and educational leaders to work together. By working together, these leaders can provide more productive and meaningful educational and employment experiences for all members of our society.

REFERENCES

- Akers, J. (1993, February 8). Interview in Roanoke, VA.
- AVA. (1989). Reauthorization positions of the American Vocational Association regarding the Carl D. Perkins Vocational Education Act of 1984. Alexandria, VA: Author.
- AVA. (1993a). In Washington. Vocational Education Journal, 68(1), 13-14.
- AVA. (1993b). Organization News. Tech Directions, 52(6), 11.
- Baxter, N. (1991). Careers 101. Occupational education in community colleges. Occupational Outlook Quarterly, 35(1), 12-22.
- Beckley, L. et al. (1989). Focus on student achievement: School and college partnership. San Francisco, CA: Paper presented at the League for Innovation in the Community College Conference, "Leadership 2000."
- Best, J. W., & Kahn, J. V. (1989). Research in education. Englewood Cliffs, NJ: Prentice-Hall, Inc.
- Brand, B. (1990a). Legislative Update. Washington, DC: Office of Vocational and Adult Education.
- Brand, B. (1990b). Preparing students for leadership in tomorrow's work. Cincinnati, OH: Paper presented at the American Vocational Association Convention.
- Brand, B. (1990c). What's Ahead for Employment and Training. Washington, DC: Office of Vocational and Adult Education.
- Brock, D. & Purdy, L. (1991, June/July). The future of telecourses and the adult learner. AACJC Journal.
- Bryant, D. W. (1992). Revisiting Tech Prep. Community College Review, 20(1), 44-47.
- Businesses must not force ideas on schools, executives say. (1992). Vocational Training News, 23(6), 1-2.

- Cahill, J. (1992, November). Keys to successful Tech Prep programs. Tech Directions, 15-16.
- Carnes, J. (1991). Northeast Texas agricultural literacy network: A rural college partnership project. Washington, DC: American Association of Community and Junior Colleges, Department of Labor, and Economic Development Administration.
- Commission on the Skills of the American Workforce. (1990). America's choice: High skills or low wages. Rochester, NY: National Center on Education and the Economy.
- CORD. (1991). Creating and sharing effective tools and techniques. National Tech Prep Network, Waco, TX: Author.
- DiPietro, J. (1991). 2+2 in health technologies. Richlands, VA: Southwest Virginia Community College.
- Dornsife, C. (1992). Beyond articulation: The development of Tech Prep programs. Berkeley, CA: National Center for Research in Vocational Education.
- Dunn, C. (1992). Tech Prep: Meeting the needs of a nation. Workplace, 1(2), 3.
- Dutton, M. G. (1991). Tech Prep: The role of the postsecondary institution. Los Angeles, CA: Paper presented to the Technical Education Division, AVA Convention.
- Feldman, M. (1988). Vocational education: Issues for our future. Paper presented at the National Convention of the American Vocational Association, St. Louis, MO.
- Gay, L. R. (1992). Educational research. New York: Macmillan Publishing Company.
- Gilli, L. M. & Gilli. (1992). Demystifying apprenticeships. Occupational Educational Forum, 20(2), 1.
- Gonzales, R. (1992). Tech Prep guidelines. Salt Lake City, UT: Utah State Office of Education.
- Gray, K. (1993). Challenging an uncertain future. Vocational Education Journal, 68(2), 35-38.

- Grover, H. J. (1991). Tech Prep in Wisconsin. Wisconsin Vocational Educator, 15(2), 1-19.
- Grubb, W. N. (1991, February). The challenge to change. Vocational Education Journal, 24-26.
- Guba, E. G., & Lincoln, Y. S. (1981). Effective evaluation. San Francisco: Jossey-Bass.
- Hata, D. M. (1990). Model 2+2+2 Tech Prep program in engineering technology. Washington, DC: Fund for the Improvement of Postsecondary Education.
- Hayward, G. (1992). Key issues in vocational education: Tip sheet for education writers. Berkeley, CA: NCRVE.
- Hearings on H.R. 7, A Bill to Extend the Carl D. Perkins Vocational Education Act and H.R. 22, Tech-Prep Education Act. (1989). Washington, DC: Government Printing Office.
- Hemmings, M. B. (1991). Tech Prep: Filling a need for America's workers. Looking Ahead, 13(1/2), 44-47.
- Hirshberg, D. (1991). The role of the community college in economic and workforce development. Los Angeles, CA: ERIC Clearinghouse for Junior Colleges.
- Hoerner, J. L. (1991a). Tech Prep and educational reform. Occupational Education Forum, 20(1), 1-5.
- Hoerner, J. L. (1991b). Tech Prep: Developing cooperative programs and partnerships. Blacksburg, VA: Virginia Polytechnic Institute and State University.
- Hoerner, J. L. (1991c). The work incentive model for Tech Prep. Blacksburg, VA: NCRVE.
- Hoerner, J. L. & Clowes, D. A. (1992). Tech Prep programs: A national study. National Center for Research in Vocational Education at Blacksburg, VA: Virginia Polytechnic Institute and State University.
- Hoerner, J. L., Clowes, D. A., Lachowicz, T., Wehrley, J., & Hammons, F. (1992). Tech Prep: An embryonic idea and divergent practice. Berkeley, CA: National Center for Research in Vocational Education.
- Hoke, R. & Suba, T. (1992, November). Indiana Tech Prep Pilot. Tech Directions, 21-25.

- Huang, N. & Gray, K. (1992). Sub-baccalaureate post secondary education: Does it pay off for vocational education graduates? Journal of Industrial Teacher Education, 29(3), 9-20.
- Hull, D. & Parnell, D. (1991). Tech Prep associate degree: A win/win experience. Waco, TX: The Center for Occupational Research and Development.
- Illinois University. (1989). Sophisticated technology, the workforce and vocational education. Springfield, IL: Illinois State Board of Education, Department of Adult, Vocational and Technical Education.
- Immerwahr, J. et al. (1991). Cross talk: The public, the experts, and competitiveness. Washington, DC: The Business-Higher Education Forum and the Public Agenda Foundation.
- Jennings, J. F. (1991, February). Congressional intent. Vocational Education Journal, 18-19.
- Kennedy, G. F. (1993, Feb). Tech Prep approaches. Tech Directions, 30-34.
- Kentucky Community College System. (1992). The role of community colleges in economic development. Lexington, KY: Author.
- Key, C. (1989). Tech Prep: Connecting to your future. Waco, TX: Center for Occupational Research and Development.
- Key, C. (1992). Capital Area Tech-Prep Consortium Background Information. Austin, TX: Author.
- Koos, L. V. (1929). The junior college. New York: Ginn.
- Lankard, B. A. (1991). Tech Prep. ERIC Digest No. 108. Columbus, OH: Center on Education and Training for Employment, The Ohio State University.
- Lewis, A. C. (1991). Business as a real partner. Phi Delta Kappan, 73(7), 420-421.

- Marsalis, C. (1991). Building an employer/education partnership. In Hull, D. & Parnell, D. (Eds.), Tech Prep associate degree: A win/win experience, pp. 277-286. Waco, TX: The Center for Occupational Research and Development.
- McKenna, J. F. (1991, September 2). Retooling Vo-Ed. Industry Week, 17.
- Mensel, F. (1989, December/January). Making vocational/technical education the priority it ought to be. AACJC Journal, 56-57.
- Miguel, L. A. (1990). School board members seek business community commitment. Springfield, IL: Illinois State Council on Vocational Education.
- Models that link school and work. From these projects could come new ways to teach job skills. (1991). Vocational Education Journal, 66(3), 29.
- Naisbitt, J. & Aburdene, P. (1985). Reinventing the corporation. New York: Warner Books.
- NCRVE. (1993, March 5). NAVE Draft Report. Berkeley, CA.
- North Carolina State Board of Community Colleges. (1990). Economic development and work force preparation. Raleigh, NC: North Carolina State Board of Education.
- O'Neil, J. (1992, March). Preparing for the changing workforce. Educational Leadership, 6-9.
- Office of Vocational and Adult Education. (1991). Washington, DC: Author.
- Parnell, D. (1984). 2 + 2 Tech Prep/Associate degree program: A working degree for America. Washington, DC: American Association of Community and Junior Colleges.
- Parnell, D. (1985). The high school/community college connection. Paper presented at a Symposium of the Cooperative for the Advancement for Community-Based Postsecondary education, Denver, CO.
- Parnell, D. (1985). The neglected majority. Washington, DC: Community College Press.

- Parnell, D. (1991). Every student a winner. In Hull, D. & Parnell, D. (Eds.), Tech Prep associate degree: A win/win experience, pp. 3-29. Waco, TX: The Center for Occupational Research and Development.
- Poister, T. H. (1978). Public program analysis: Applied research methods. Baltimore: University Park Press.
- Portland Area Vocational-Technical Education Consortium. (1990). Preparing workforce 2000 through vocational technical 2+2 programs. Portland, OR: Author.
- Public Law 101-392. (1990, September 25). 101st Congress, 104 STAT. 753-792.
- Purcell, J. (1992a). Challenges of reforming education. Autodesk, Inc. Supplement to the Technological Horizons in Education Journal, 20(3), 2-4.
- Purcell, J. (1992b). Curricula for a changing world. Autodesk, Inc. Supplement to the Technological Horizons in Education Journal, 20(3), 18-22.
- Rice, M. (1991). Developing an effective mentoring program. In Hull, D. & Parnell, D. (Eds.), Tech Prep associate degree: A win/win experience, pp. 287-298. Waco, TX: The Center for Occupational Research and Development.
- Roanoke Area Tech Prep Consortium. (1992, September). Summary of 670 visits with Roanoke, VA employers. Roanoke, VA: Author.
- Roanoke City Public Schools. (1990). Roanoke area 2+2 program in automated manufacturing technology. Richmond, VA: Virginia State Department of Education.
- Secretary's Commission on Achieving Necessary Skills. (1991). What work requires of schools: A SCANS report for America 2000. Washington, DC: U.S. Department of Labor.
- Staff. (1989). Compendium of models for Tech Prep. Middletown, DE: Statewide Vocational-Technical High Schools and Delaware Technical and Community College.
- Staff. (1990). Compendium of models for Tech Prep. Middletown, DE: Statewide Vocational-Technical High Schools and Delaware Technical and Community College.

- Staff. (1991). Facts and figures on Tech Prep. Richmond, VA: State Department of Education, Virginia Community College System.
- Staff. (1991). VCCS Deans/Provosts meeting and Tech-Prep conference. Portsmouth, VA: Virginia Community College System.
- Staff. (1992). Tech Prep/Associate Degree: A concept paper. Roanoke Tech Prep Consortium.
- Staff. (1992). What is Tech Prep? Roanoke, VA: Roanoke Area Tech Prep Consortium News.
- Texas Higher Education Coordinating Board, Community Colleges and Technical Institutes Division. (1991). Tech-Prep associate degree program model. Austin, TX: Author.
- Thompson, N. (1992, May 31). Radical method is working. Roanoke Times & World-News, B1, 5.
- United States Department of Education, Office of Vocational and Adult Education. (1991, January 18). Estimated allocations under the Perkins Act as amended for program year 1991-92. Washington, DC: Author.
- United States Department of Education. (1990). National goals for education. Washington, DC: Author.
- Virginia Council on Vocational Education. (1992, October). Extent of involvement of business, industry and labor in Virginia Tech Prep projects. Richmond, VA: Author.
- Walters, L. S. (1992). Economics and education. The Christian Science Monitor, Monday, September 28.
- Warnat, W. I. (1991, May). Preparing a world-class workforce. Vocational Education Journal, 22-25.
- Welford, A. & Akers, J. (1992). Business input boosts Tech Prep. Vocational Education Journal, 67(7), 72.
- Wentling, T. L. (1990). Technology preparation pilot test. School year 1989-1990. Evaluation report. Indianapolis, IN: Indiana State Board of Education.

- Wentling, T. L. (1991). Technology preparation pilot test. Year 2, school year 1990-1991. Evaluation report. Indianapolis, IN: Indiana State Board of Education.
- Wilcox, J. (1991). Perkins Act at a glance. Vocational Education Journal, 66(2), 16-17.
- William T. Grant Foundation Commission on Work, Family, and Citizenship. (1988). The forgotten half: Pathways to success for America's youth and young families. Washington, DC: Author.
- William T. Grant Foundation Commission on Work, Family, and Citizenship. (1991). States and communities on the move: Policy initiatives to create a world-class workforce. Washington, DC: Author.
- Wimmer, D. K. (1988). Enabling professionalism: The master technician program. New Directions for Community Colleges, 16(3), 95-100.
- Wimmer, D. K. (1992). How to build a Tech Prep project. Vocational Education Journal, 67(7), 71.
- Wisconsin University. (1991). Assuring Wisconsin's economic future: Improving occupational options for youth. Madison, WI: Wisconsin State Board of Vocational, Technical, and Adult Education.
- Wuertele, P. (1990, Feb/Mar). The business & industry liaison as consultant. AACJC Journal.

APPENDICES

APPENDIX A: QUESTIONNAIRE

QUESTIONNAIRE

BUSINESS-INDUSTRY-EDUCATION INVOLVEMENT IN TECH PREP PROGRAMS

Introduction

This questionnaire solicits information regarding business-industry-education (B-I-E) methods for involvement in Tech Prep programs in community colleges and secondary schools in Virginia. This research study seeks input from Tech Prep Project "Key Persons" at community colleges and secondary schools in Virginia. Part I includes specific questions about methods for business-industry-education involvement in Tech Prep programs in Virginia's community colleges and secondary schools. Part II solicits general Tech Prep program information.

Part I: Methods for Business-Industry-Education Involvement

Which of the following methods for B-I-E involvement do you use in your Tech Prep programs? Please check your response using the following scale:

U = USUALLY; O = OFTEN; S = SOMETIMES; AN = ALMOST NEVER; Y = YES;
N = NO.

CAREER INFORMATION AND GUIDANCE

(Items 01 - 10 focus on students exclusively.)

B/I = Business and/or Industry

- | | |
|---|------------------|
| 01. Arrange for student plant tours? | U__ O__ S__ AN__ |
| 02. Conduct exploratory/career awareness opportunities? | U__ O__ S__ AN__ |
| 03. Conduct in-house (plant or B/I site) training programs? | U__ O__ S__ AN__ |

- | | |
|--|------------------|
| 04. Offer videos about company products and services? | U__ O__ S__ AN__ |
| 05. Participate in work-based learning experiences? | U__ O__ S__ AN__ |
| 06. Provide individual student consultation/counseling? | U__ O__ S__ AN__ |
| 07. Provide speakers for business-industry-education days? | U__ O__ S__ AN__ |
| 08. Sponsor student field trips? | U__ O__ S__ AN__ |
| 09. Sponsor student mentorships? | U__ O__ S__ AN__ |
| 10. Help with student needs assessments? | U__ O__ S__ AN__ |

CURRICULUM AND INSTRUCTION

- | | |
|---|------------------|
| 11. Does B/I assist teachers in developing specific teaching units? | U__ O__ S__ AN__ |
| 12. Does B/I award credit to students for demonstrated work-based competencies? | U__ O__ S__ AN__ |
| 13. Does B/I help teachers develop competency-based requirements? | U__ O__ S__ AN__ |
| 14. Does B/I help teachers in developing new courses? | U__ O__ S__ AN__ |
| 15. Does B/I help teachers in developing a curriculum? | U__ O__ S__ AN__ |
| 16. Does B/I help teachers in revising existing curriculum? | U__ O__ S__ AN__ |
| 17. Does B/I identify student outcomes required for future jobs? | U__ O__ S__ AN__ |
| 18. Does B/I identify student outcomes required for current jobs? | U__ O__ S__ AN__ |
| 19. Is B/I members of Curriculum Committee? | Y__ N__ |
| 20. If 19 is Yes, how often does B/I participate? | U__ O__ S__ AN__ |
| 21. Does B/I review course content for job relevance? | U__ O__ S__ AN__ |
| 22. Does B/I review curricula for job relevance? | U__ O__ S__ AN__ |

FINANCIAL AID

(Items 23 - 27 focus on B/I exclusively.)

- | | |
|--|------------------|
| 23. Provide equipment to schools? | U__ O__ S__ AN__ |
| 24. Provide financial support? | U__ O__ S__ AN__ |
| 25. Provide student scholarships? | U__ O__ S__ AN__ |
| 26. Sponsor part-time (summer) employment
for students? | U__ O__ S__ AN__ |
| 27. Sponsor part-time (yearly) employment
for students? | U__ O__ S__ AN__ |

MARKETING AND RECRUITMENT

- | | |
|--|------------------|
| 28. Is B/I members of Marketing Committee? | Y__ N__ |
| 29. If 28 is Yes, how often does B/I
participate? | U__ O__ S__ AN__ |
| 30. Does B/I participate in recruitment
activities? | U__ O__ S__ AN__ |
| 31. Does B/I serve as advocates for Tech Prep? | U__ O__ S__ AN__ |

PLACEMENT AND JOBS

(Items 32 - 36 focus on B/I exclusively.)

- | | |
|---|------------------|
| 32. Offer student on-the-job training? | U__ O__ S__ AN__ |
| 33. Participate in student placement
activities? | U__ O__ S__ AN__ |
| 34. Provide student internships? | U__ O__ S__ AN__ |
| 35. Sponsor student apprenticeship programs? | U__ O__ S__ AN__ |
| 36. Sponsor student coop programs? | U__ O__ S__ AN__ |

PLANNING, DEVELOPMENT AND EVALUATION

(Items 37 - 54 focus on B/I exclusively.)

- | | |
|--|------------------|
| 37. Does B/I assist with student
follow-up evaluations? | U__ O__ S__ AN__ |
| 38. Does B/I get involved in the planning
stages of Tech Prep programs? | U__ O__ S__ AN__ |
| 39. Does B/I help in developing Tech Prep
programs? | U__ O__ S__ AN__ |

40. Does B/I get involved in implementation of programs? U__ O__ S__ AN__
41. Is B/I members of Advisory Committee? Y__ N__
42. If 41 is Yes, how often does B/I participate? U__ O__ S__ AN__
43. Is B/I members of Coordinating Committee? Y__ N__
44. If 43 is Yes, how often does B/I participate? U__ O__ S__ AN__
45. Is B/I members of Executive Committee? Y__ N__
46. If 45 is Yes, how often does B/I participate? U__ O__ S__ AN__
47. Is B/I members of Program Improvement Committee? Y__ N__
48. If 47 is Yes, how often does B/I participate? U__ O__ S__ AN__
49. Is B/I members of Staff Development Committee? Y__ N__
50. If 49 is Yes, how often does B/I participate? U__ O__ S__ AN__
51. Is B/I members of Steering Committee? Y__ N__
52. If 51 is Yes, how often does B/I participate? U__ O__ S__ AN__
53. Does B/I participate in business-industry-education partnerships? U__ O__ S__ AN__
54. Does B/I participate in in-service professional development? U__ O__ S__ AN__

RESOURCES OTHER THAN FINANCIAL

55. Does B/I allow their company personnel to teach in schools? U__ O__ S__ AN__
56. Does B/I allow for adult retraining? U__ O__ S__ AN__
57. Does B/I participate in adopt-a-school programs? U__ O__ S__ AN__
58. Does B/I participate in business-industry-educator exchanges? U__ O__ S__ AN__
59. Does B/I participate in job fairs? U__ O__ S__ AN__

60. Does B/I participate in work-a-day programs? U__ O__ S__ AN__
61. Does B/I participate in workshops/forums? U__ O__ S__ AN__
62. Does B/I provide career-day speakers? U__ O__ S__ AN__
63. Does B/I provide classroom speakers? U__ O__ S__ AN__
64. Does B/I provide space for classes? U__ O__ S__ AN__
65. Does B/I provide teacher awards? U__ O__ S__ AN__

Other Methods of Involvement? Please identify below.

66. _____ U__ O__ S__ AN__
67. _____ U__ O__ S__ AN__
68. _____ U__ O__ S__ AN__
69. _____ U__ O__ S__ AN__
70. _____ U__ O__ S__ AN__

Part II: General Tech Prep Program Information

71. I am a Tech Prep Project Key Person at a:
Community College__ Secondary School__
72. Please list your principal job title at the community college or secondary school that you checked above.

73. Approximate percent of time spent on Tech Prep program activities?
0-25%__ 26-50%__ 51-75%__ 76-100%__
74. Approximate percent of time spent on Tech Prep program activities that is compensated with Tech Prep funds?
0-25%__ 26-50%__ 51-75%__ 76-100%__
75. Number of Tech Prep projects that you are involved with at your institution?
1__ 2__ 3__ 4__

76. How long have you been involved with Tech Prep?
 0-1 year___ 1-2 years___ 2-3 years___
77. Which category best describes your professional education?
 Academic___ Vocational___
78. What stage of development best describes your Tech Prep program?
 ___ Planning Stage (establishing committees-consortium members)
 ___ Developmental Stage (writing curriculum/producing marketing tools)
 ___ Implementation Stage (curriculum written and student recruitment)
 ___ Advanced Stage (students enrolled and/or graduating from programs)
79. Does your Tech Prep program have a job placement component?
 Yes___ No___

The remaining part of this survey addresses the characteristics of businesses and industries that participate in Tech Prep programs. For example, if the B/I manufactures items such as castings, automotive parts, mining equipment, etc., please list the particular product manufactured. If the B/I is a service firm such as a health care provider, contractor, insurance company, etc., please list the particular type of service provided. After checking either manufacturing or service, please list the product manufactured or the service provided in the space below.

80. The primary business-industry that I am involved with in Tech Prep:
 Manufacturing___ Service___

81. Size of business in Question 80 by number of employees?
 1 to 49___ 50 to 99___ 100 to 199___ 200 and up___
82. Type of business in Question 80?
 Profit___ Non Profit___
83. Another business-industry that I am involved with in Tech Prep:
 Manufacturing___ Service___

84. Size of business in Question 83 by number of employees?
 1 to 49___ 50 to 99___ 100 to 199___ 200 and up___
85. Type of business in Question 83?
 Profit___ Non Profit___
86. Another business-industry that I am involved with in Tech Prep:
 Manufacturing___ Service___

87. Size of business in Question 86 by number of employees?
 1 to 49___ 50 to 99___ 100 to 199___ 200 and up___
88. Type of business in Question 86?
 Profit___ Non Profit___

APPENDIX B: INITIAL COVER LETTER

APPENDIX B

Initial Cover Letter

Virginia Tech Stationery

June 1, 1993

Name, Title
Institution
Street Address
City, State Zip Code

Dear Mr./Mrs. Name:

Tech Prep programs have recently received Congressional support with the passing of the Carl D. Perkins Vocational and Applied Technology Education Act on September 25, 1990. The guidelines for funding are intended to encourage growth and development of Tech Prep. This funding greatly affects business-industry-education (B-I-E) involvement in Tech Prep programs in Virginia's community colleges and secondary schools.

Your Tech Prep project is one in which "Key Persons" are being asked to give their opinion on these matters. Your name was drawn in a purposive sample. In order that the results will accurately represent the thinking of participants in Tech Prep programs in Virginia, it is important that each questionnaire be completed and returned. Please complete the questionnaire by June 15, 1993, and return it in the self-addressed, postage paid, return envelope.

You may be assured of complete confidentiality. If you are interested in the findings of this study, I will be glad to mail you an Executive Summary. The results of this research will be made available to those interested in Tech Prep. I would be most happy to answer any questions that you may have. Please call me collect at 703-774-0154. Thank you for your cooperation.

Sincerely,

Tom Lachowicz
Project Director

APPENDIX C: FIRST FOLLOW-UP LETTER

APPENDIX C

First Follow-Up Letter

Virginia Tech Stationery

June 8, 1993

Name, Title
Institution
Street Address
City, State Zip Code

Dear Mr./Mrs. Name:

Last week a questionnaire seeking your opinion on business-industry-education (B-I-E) involvement in Tech Prep programs in Virginia's community colleges and secondary schools was mailed to you. If you have already completed and returned it to us, please accept our sincere thanks. If not, please return it today.

Because the questionnaire is only being sent to a small, but purposive sample of Tech Prep Key Persons, it is extremely important that your response be included in the study if the results are to accurately represent the opinions of your group.

If by chance you did not receive the questionnaire, or if it was misplaced, please call me right now, collect 703-774-0154, and I will send you another one immediately.

Sincerely,

Tom Lachowicz
Project Director

APPENDIX D: SECOND FOLLOW-UP LETTER

APPENDIX D

Second Follow-Up Letter

Virginia Tech Stationery

June 22, 1993

Name, Title
Institution
Street Address
City, State Zip Code

Dear Mr./Mrs. Name:

About three weeks ago I wrote to you seeking your opinion on business-industry-education involvement in Tech Prep programs in community colleges and secondary schools. As of now, I have not received your completed questionnaire.

This research was undertaken because of my belief that the opinions of Tech Prep Key Persons regarding business-industry-education involvement in Tech Prep programs are essential to the growth and development of Tech Prep in community colleges and secondary schools. It is my belief that your opinions must be taken into account in the formation of business-industry-education methods for involvement in which you have a vested interest.

I am writing to you again because of the significance each questionnaire has to the usefulness of this study. Your name was drawn through a purposive sampling process. In order for the results of this study to truly represent the opinions of Tech Prep participants, it is essential that each person in the sample return his/her questionnaire. As mentioned in my last letter, you may be assured of complete confidentiality.

If your questionnaire has been misplaced, a replacement is enclosed. **Please complete and return the questionnaire today** in the self-addressed, stamped envelope. Your cooperation is greatly appreciated.

Sincerely,

Tom Lachowicz
Project Director

APPENDIX E: QUESTIONNAIRE RESPONSES

QUESTIONNAIRE RESPONSES

U = Usually; O = Often; S = Sometimes; AN = Almost Never

C = Community College Respondents

S = Secondary School Respondents

CAREER INFORMATION AND GUIDANCE

(Items 01 - 10 focus on students exclusively.)

B/I = Business and/or Industry

01. Arrange for student plant tours?	C = U <u>1</u> O <u>3</u> S <u>12</u> AN <u>5</u> S = U <u>5</u> O <u>3</u> S <u>12</u> AN <u>1</u>
02. Conduct exploratory/career awareness opportunities?	C = U <u>3</u> O <u>6</u> S <u>10</u> AN <u>2</u> S = U <u>7</u> O <u>5</u> S <u>7</u> AN <u>2</u>
03. Conduct in-house (plant or B/I site) training programs?	C = U <u>0</u> O <u>4</u> S <u>10</u> AN <u>7</u> S = U <u>3</u> O <u>3</u> S <u>8</u> AN <u>7</u>
04. Offer videos about company products and services?	C = U <u>0</u> O <u>2</u> S <u>7</u> AN <u>12</u> S = U <u>1</u> O <u>6</u> S <u>9</u> AN <u>5</u>
05. Participate in work-based learning experiences?	C = U <u>0</u> O <u>7</u> S <u>10</u> AN <u>4</u> S = U <u>5</u> O <u>6</u> S <u>8</u> AN <u>2</u>
06. Provide individual student consultation/counseling?	C = U <u>5</u> O <u>4</u> S <u>5</u> AN <u>7</u> S = U <u>7</u> O <u>4</u> S <u>8</u> AN <u>2</u>
07. Provide speakers for business-industry-education days?	C = U <u>6</u> O <u>7</u> S <u>5</u> AN <u>3</u> S = U <u>10</u> O <u>10</u> S <u>1</u> AN <u>0</u>
08. Sponsor student field trips?	C = U <u>3</u> O <u>5</u> S <u>10</u> AN <u>3</u> S = U <u>7</u> O <u>3</u> S <u>9</u> AN <u>2</u>
09. Sponsor student mentorships?	C = U <u>1</u> O <u>5</u> S <u>6</u> AN <u>9</u> S = U <u>2</u> O <u>5</u> S <u>8</u> AN <u>6</u>
10. Help with student needs assessments?	C = U <u>2</u> O <u>5</u> S <u>5</u> AN <u>9</u> S = U <u>5</u> O <u>7</u> S <u>2</u> AN <u>7</u>

CURRICULUM AND INSTRUCTION

11.	Does B/I assist teachers in developing specific teaching units?	C = U <u>4</u> O <u>3</u> S <u>6</u> AN <u>8</u> S = U <u>2</u> O <u>7</u> S <u>7</u> AN <u>5</u>
12.	Does B/I award credit to students for demonstrated work-based competencies?	C = U <u>2</u> O <u>5</u> S <u>4</u> AN <u>10</u> S = U <u>2</u> O <u>6</u> S <u>7</u> AN <u>6</u>
13.	Does B/I help teachers develop competency-based requirements?	C = U <u>7</u> O <u>5</u> S <u>9</u> AN <u>0</u> S = U <u>8</u> O <u>3</u> S <u>7</u> AN <u>3</u>
14.	Does B/I help teachers in developing new courses?	C = U <u>4</u> O <u>5</u> S <u>9</u> AN <u>3</u> S = U <u>6</u> O <u>5</u> S <u>7</u> AN <u>3</u>
15.	Does B/I help teachers in developing a curriculum?	C = U <u>8</u> O <u>5</u> S <u>7</u> AN <u>1</u> S = U <u>9</u> O <u>6</u> S <u>4</u> AN <u>2</u>
16.	Does B/I help teachers in revising existing curriculum?	C = U <u>6</u> O <u>7</u> S <u>6</u> AN <u>2</u> S = U <u>9</u> O <u>7</u> S <u>2</u> AN <u>3</u>
17.	Does B/I identify student outcomes required for future jobs?	C = U <u>9</u> O <u>5</u> S <u>6</u> AN <u>1</u> S = U <u>8</u> O <u>5</u> S <u>8</u> AN <u>0</u>
18.	Does B/I identify student outcomes required for current jobs?	C = U <u>9</u> O <u>7</u> S <u>4</u> AN <u>1</u> S = U <u>7</u> O <u>7</u> S <u>7</u> AN <u>0</u>
19.	Is B/I members of Curriculum Committee?	C = Y <u>16</u> N <u>5</u> S = Y <u>20</u> N <u>1</u>
20.	If 19 is Yes, how often does B/I participate?	C = U <u>7</u> O <u>6</u> S <u>3</u> AN <u>0</u> S = U <u>10</u> O <u>6</u> S <u>4</u> AN <u>0</u>
21.	Does B/I review course content for job relevance?	C = U <u>10</u> O <u>3</u> S <u>5</u> AN <u>3</u> S = U <u>10</u> O <u>4</u> S <u>7</u> AN <u>0</u>
22.	Does B/I review curricula for job relevance?	C = U <u>11</u> O <u>2</u> S <u>5</u> AN <u>3</u> S = U <u>10</u> O <u>6</u> S <u>4</u> AN <u>1</u>

FINANCIAL AID

23.	Provide equipment to schools?	C = U <u>1</u>	O <u>1</u>	S <u>11</u>	AN <u>8</u>
		S = U <u>1</u>	O <u>7</u>	S <u>11</u>	AN <u>2</u>
24.	Provide financial support?	C = U <u>1</u>	O <u>1</u>	S <u>9</u>	AN <u>10</u>
		S = U <u>1</u>	O <u>4</u>	S <u>8</u>	AN <u>8</u>
25.	Provide student scholarships?	C = U <u>1</u>	O <u>4</u>	S <u>10</u>	AN <u>6</u>
		S = U <u>3</u>	O <u>5</u>	S <u>8</u>	AN <u>5</u>
26.	Sponsor part-time (summer) employment for students?	C = U <u>1</u>	O <u>4</u>	S <u>10</u>	AN <u>6</u>
		S = U <u>3</u>	O <u>9</u>	S <u>7</u>	AN <u>2</u>
27.	Sponsor part-time (yearly) employment for students?	C = U <u>3</u>	O <u>3</u>	S <u>11</u>	AN <u>4</u>
		S = U <u>3</u>	O <u>8</u>	S <u>8</u>	AN <u>2</u>

MARKETING AND RECRUITMENT

28.	Is B/I members of Marketing Committee?	C = Y <u>17</u>	N <u>4</u>		
		S = Y <u>16</u>	N <u>6</u>		
29.	If 28 is Yes, how often does B/I participate?	C = U <u>8</u>	O <u>2</u>	S <u>7</u>	AN <u>0</u>
		S = U <u>4</u>	O <u>8</u>	S <u>4</u>	AN <u>0</u>
30.	Does B/I participate in recruitment activities?	C = U <u>2</u>	O <u>2</u>	S <u>10</u>	AN <u>7</u>
		S = U <u>2</u>	O <u>6</u>	S <u>11</u>	AN <u>3</u>
31.	Does B/I serve as advocates for Tech Prep?	C = U <u>8</u>	O <u>7</u>	S <u>6</u>	AN <u>0</u>
		S = U <u>9</u>	O <u>7</u>	S <u>5</u>	AN <u>1</u>

PLACEMENT AND JOBS

32.	Offer student on-the-job training?	C = U <u>1</u>	O <u>6</u>	S <u>9</u>	AN <u>5</u>
		S = U <u>5</u>	O <u>7</u>	S <u>9</u>	AN <u>0</u>
33.	Participate in student placement activities?	C = U <u>0</u>	O <u>5</u>	S <u>8</u>	AN <u>8</u>
		S = U <u>5</u>	O <u>6</u>	S <u>6</u>	AN <u>4</u>
34.	Provide student internships?	C = U <u>0</u>	O <u>5</u>	S <u>10</u>	AN <u>6</u>
		S = U <u>3</u>	O <u>3</u>	S <u>10</u>	AN <u>5</u>
35.	Sponsor student apprenticeship programs?	C = U <u>0</u>	O <u>2</u>	S <u>8</u>	AN <u>11</u>
		S = U <u>2</u>	O <u>5</u>	S <u>4</u>	AN <u>10</u>
36.	Sponsor student coop programs?	C = U <u>3</u>	O <u>7</u>	S <u>6</u>	AN <u>5</u>
		S = U <u>6</u>	O <u>11</u>	S <u>3</u>	AN <u>1</u>

PLANNING, DEVELOPMENT AND EVALUATION

- | | |
|---|--|
| 37. Does B/I assist with student follow-up evaluations? | C = U <u>4</u> O <u>3</u> S <u>6</u> AN <u>9</u>
S = U <u>3</u> O <u>3</u> S <u>7</u> AN <u>8</u> |
| 38. Does B/I get involved in the planning stages of Tech Prep programs? | C = U <u>13</u> O <u>6</u> S <u>3</u> AN <u>0</u>
S = U <u>10</u> O <u>5</u> S <u>7</u> AN <u>0</u> |
| 39. Does B/I help in developing Tech Prep programs? | C = U <u>15</u> O <u>3</u> S <u>4</u> AN <u>0</u>
S = U <u>10</u> O <u>6</u> S <u>6</u> AN <u>0</u> |
| 40. Does B/I get involved in implementation of programs? | C = U <u>5</u> O <u>6</u> S <u>5</u> AN <u>6</u>
S = U <u>10</u> O <u>3</u> S <u>9</u> AN <u>0</u> |
| 41. Is B/I members of Advisory Committee? | C = Y <u>21</u> N <u>1</u>
S = Y <u>22</u> N <u>0</u> |
| 42. If 41 is Yes, how often does B/I participate? | C = U <u>11</u> O <u>4</u> S <u>6</u> AN <u>0</u>
S = U <u>12</u> O <u>8</u> S <u>2</u> AN <u>0</u> |
| 43. Is B/I members of Coordinating Committee? | C = Y <u>18</u> N <u>4</u>
S = Y <u>14</u> N <u>8</u> |
| 44. If 43 is Yes, how often does B/I participate? | C = U <u>7</u> O <u>3</u> S <u>8</u> AN <u>0</u>
S = U <u>8</u> O <u>2</u> S <u>4</u> AN <u>0</u> |
| 45. Is B/I members of Executive Committee? | C = Y <u>15</u> N <u>7</u>
S = Y <u>14</u> N <u>7</u> |
| 46. If 45 is Yes, how often does B/I participate? | C = U <u>2</u> O <u>6</u> S <u>7</u> AN <u>0</u>
S = U <u>8</u> O <u>3</u> S <u>3</u> AN <u>0</u> |
| 47. Is B/I members of Program Improvement Committee? | C = Y <u>11</u> N <u>11</u>
S = Y <u>10</u> N <u>11</u> |
| 48. If 47 is Yes, how often does B/I participate? | C = U <u>4</u> O <u>4</u> S <u>3</u> AN <u>0</u>
S = U <u>5</u> O <u>3</u> S <u>2</u> AN <u>0</u> |
| 49. Is B/I members of Staff Development Committee? | C = Y <u>10</u> N <u>12</u>
S = Y <u>9</u> N <u>12</u> |
| 50. If 49 is Yes, how often does B/I participate? | C = U <u>3</u> O <u>3</u> S <u>4</u> AN <u>0</u>
S = U <u>3</u> O <u>4</u> S <u>2</u> AN <u>0</u> |
| 51. Is B/I members of Steering Committee? | C = Y <u>18</u> N <u>4</u>
S = Y <u>15</u> N <u>7</u> |

52.	If 51 is Yes, how often does B/I participate?	C = U <u>8</u>	O <u>6</u>	S <u>4</u>	AN <u>0</u>
		S = U <u>10</u>	O <u>3</u>	S <u>2</u>	AN <u>0</u>
53.	Does B/I participate in business-industry-education partnerships?	C = U <u>9</u>	O <u>4</u>	S <u>5</u>	AN <u>4</u>
		S = U <u>11</u>	O <u>3</u>	S <u>7</u>	AN <u>0</u>
54.	Does B/I participate in in-service professional development?	C = U <u>8</u>	O <u>2</u>	S <u>7</u>	AN <u>5</u>
		S = U <u>4</u>	O <u>3</u>	S <u>9</u>	AN <u>5</u>

RESOURCES OTHER THAN FINANCIAL

55.	Does B/I allow their company personnel to teach in schools?	C = U <u>6</u>	O <u>4</u>	S <u>3</u>	AN <u>8</u>
		S = U <u>3</u>	O <u>6</u>	S <u>7</u>	AN <u>6</u>
56.	Does B/I allow for adult retraining?	C = U <u>10</u>	O <u>6</u>	S <u>1</u>	AN <u>4</u>
		S = U <u>6</u>	O <u>4</u>	S <u>10</u>	AN <u>2</u>
57.	Does B/I participate in adopt-a-school programs?	C = U <u>5</u>	O <u>2</u>	S <u>7</u>	AN <u>7</u>
		S = U <u>4</u>	O <u>5</u>	S <u>8</u>	AN <u>5</u>
58.	Does B/I participate in business-industry-educator exchanges?	C = U <u>3</u>	O <u>4</u>	S <u>7</u>	AN <u>7</u>
		S = U <u>3</u>	O <u>4</u>	S <u>9</u>	AN <u>6</u>
59.	Does B/I participate in job fairs?	C = U <u>11</u>	O <u>5</u>	S <u>5</u>	AN <u>1</u>
		S = U <u>12</u>	O <u>8</u>	S <u>2</u>	AN <u>0</u>
60.	Does B/I participate in work-a-day programs?	C = U <u>0</u>	O <u>0</u>	S <u>11</u>	AN <u>10</u>
		S = U <u>4</u>	O <u>3</u>	S <u>9</u>	AN <u>6</u>
61.	Does B/I participate in workshops/forums?	C = U <u>4</u>	O <u>5</u>	S <u>9</u>	AN <u>4</u>
		S = U <u>8</u>	O <u>6</u>	S <u>8</u>	AN <u>0</u>
62.	Does B/I provide career-day speakers?	C = U <u>10</u>	O <u>5</u>	S <u>6</u>	AN <u>1</u>
		S = U <u>13</u>	O <u>9</u>	S <u>0</u>	AN <u>0</u>
63.	Does B/I provide classroom speakers?	C = U <u>7</u>	O <u>8</u>	S <u>6</u>	AN <u>1</u>
		S = U <u>12</u>	O <u>8</u>	S <u>2</u>	AN <u>0</u>
64.	Does B/I provide space for classes?	C = U <u>2</u>	O <u>1</u>	S <u>9</u>	AN <u>9</u>
		S = U <u>4</u>	O <u>3</u>	S <u>6</u>	AN <u>9</u>
65.	Does B/I provide teacher awards?	C = U <u>1</u>	O <u>0</u>	S <u>7</u>	AN <u>13</u>
		S = U <u>2</u>	O <u>3</u>	S <u>6</u>	AN <u>11</u>

APPENDIX F: COMPOSITION OF ALL RESPONDENTS

APPENDIX F

COMPOSITION OF ALL RESPONDENTS

71. I am a Tech Prep Project Key Person at a:
Community College 22 Secondary School 22
72. Please list your principle job title at the community college or secondary school that you checked above.
(See composition for community colleges/secondary schools.)
73. Approximate percent of time spent on Tech Prep program activities?
0-25% 26 26-50% 4 51-75% 7 76-100% 7
74. Approximate percent of time spent on Tech Prep program activities that is compensated with Tech Prep funds?
0-25% 31 26-50% 5 51-75% 2 76-100% 6
75. Number of Tech Prep projects that you are involved with at your institution?
1 20 2 11 3 9 4 4
76. How long have you been involved with Tech Prep?
0-1 year 8 1-2 years 16 2-3 years 18 +4 years 2 *
77. Which category best describes your professional education?
Academic 21 Vocational 17 Both 5 Administrative 1
78. What stage of development best describes your Tech Prep program
5 Planning Stage (establishing committees-consortium members)
28 Developmental Stage (writing curriculum/producing marketing tools)
9 Implementation Stage (curriculum written and student recruitment)
2 Advanced Stage (students enrolled and/or graduating from programs)
79. Does your Tech Prep program have a job placement component?
Yes 16 No 28

Note. * The questionnaire did not show +4 years, but 2 respondents wrote it in.

APPENDIX G: COMPOSITION OF COMMUNITY COLLEGE RESPONDENTS

APPENDIX G

COMPOSITION OF COMMUNITY COLLEGE RESPONDENTS

71. I am a Tech Prep Project Key Person at a:
Community College 22 Secondary School
72. Please list your principle job title at the community college or secondary school that you checked above.
(See composition for community colleges/secondary schools.)
73. Approximate percent of time spent on Tech Prep program activities?
0-25% 10 26-50% 1 51-75% 6 76-100% 5
74. Approximate percent of time spent on Tech Prep program activities that is compensated with Tech Prep funds?
0-25% 12 26-50% 3 51-75% 2 76-100% 5
75. Number of Tech Prep projects that you are involved with at your institution?
1 11 2 5 3 4 4 2
76. How long have you been involved with Tech Prep?
0-1 year 5 1-2 years 6 2-3 years 10 +4 years 1 *
77. Which category best describes your professional education?
Academic 15 Vocational 5 Both 1 Administrative 1
78. What stage of development best describes your Tech Prep program
2 Planning Stage (establishing committees-consortium members)
17 Developmental Stage (writing curriculum/producing marketing tools)
3 Implementation Stage (curriculum written and student recruitment)
0 Advanced Stage (students enrolled and/or graduating from programs)
79. Does your Tech Prep program have a job placement component?
Yes 9 No 13

Note. * The questionnaire did not show +4 years, but 1 respondent wrote it in.

APPENDIX H: COMPOSITION OF SECONDARY SCHOOL RESPONDENTS

APPENDIX H

COMPOSITION OF SECONDARY SCHOOL RESPONDENTS

71. I am a Tech Prep Project Key Person at a:
Community College Secondary School 22
72. Please list your principle job title at the community college or secondary school that you checked above.
(See composition for community colleges/secondary schools.)
73. Approximate percent of time spent on Tech Prep program activities?
0-25% 16 26-50% 3 51-75% 1 76-100% 2
74. Approximate percent of time spent on Tech Prep program activities that is compensated with Tech Prep funds?
0-25% 19 26-50% 2 51-75% 0 76-100% 1
75. Number of Tech Prep projects that you are involved with at your institution?
1 9 2 6 3 5 4 2
76. How long have you been involved with Tech Prep?
0-1 year 3 1-2 years 10 2-3 years 8 +4 years 1 *
77. Which category best describes your professional education?
Academic 6 Vocational 12 Both 4 Administrative 0
78. What stage of development best describes your Tech Prep program
3 Planning Stage (establishing committees-consortium members)
11 Developmental Stage (writing curriculum/producing marketing tools)
6 Implementation Stage (curriculum written and student recruitment)
2 Advanced Stage (students enrolled and/or graduating from programs)
79. Does your Tech Prep program have a job placement component?
Yes 7 No 15

Note. * The questionnaire did not show +4 years, but 1 respondent wrote it in.

VITA

Thomas (Tom) Lachowicz was born in McKees Rocks, Pennsylvania, on December 21, 1939. His parents were Thomas Lachowicz and Mary Smolen. Tom's first 17 years were spent in the Pittsburgh area in western Pennsylvania.

He graduated from McKees Rocks High School in 1957. In the fall of 1957, he joined the United States Air Force and was assigned to the Aircraft Control and Warning Squadron where he specialized in radio and radar maintenance. His tour of duty included Texas, Mississippi, Illinois, Maine, Massachusetts, and Okinawa. After four years of duty, he returned to the United States and worked as an electronics technician.

In 1963 he entered the University of Maryland and graduated in 1966 with a Bachelor's of Arts Degree in American Studies. From 1966 until 1974, he worked in various sales positions, including Salesman, District Manager, National Accounts Manager, and Project Manager in large corporations such as H. K. Porter Company and Emerson Electric. From 1974 until 1977, he became General Sales Manager and then Vice President of Roanoke Belt and Rubber Company and Automated Materials Inc.

In 1977, he started the first of many of his own businesses, Coal Company Corporation. From 1977 until 1988,

he started and operated Mineco, a sales agency; The Gasket King, a gasket processing company; Tri-State Construction, a turnkey construction company; TCL Leasing Co., an equipment leasing company; Consolidated Designers and Fabricators, a design, engineering, and manufacturing company; L&H Co., a real estate operation; and Materials Handling Company of Virginia, a manufacturing company.

In the fall of 1988, he was awarded a graduate teaching assistantship in the College of Business and Economics at Radford University. He assisted with classroom teaching and research and graduated with a Masters of Business Administration in 1990. During this time, he worked as an adjunct faculty member at Virginia Western Community College.

In the fall of 1990, he entered Virginia Polytechnic Institute and State University to begin his doctoral studies in Community College Education. He was awarded a graduate research assistantship and performed research and writing assignments in the area of Tech Prep, and professional development.

Publications include:

Clowes, D. A., Hoerner, J. L., Hall, M., and Lachowicz, T. (1992). Professional development for postsecondary occupational faculty. National Council for Occupational Education in cooperation with the NCRVE.

Hoerner, J. L., Clowes, D. A., Lachowicz, T., Wehrley, J., and Hammons, F. (1992). Tech Prep: An embryonic idea and divergent practice. National Center for Research in Vocational Education.

Lachowicz, T. and Clowes, D. A. (1991). The Catalyst and community services and continuing education: Lessons from 20 years. Catalyst, 21(3), 3-9.

Lachowicz, T. (1993). Business-industry-education involvement in Tech Prep programs. Dissertation.

Mattson, M. and Lachowicz, T. (1991). Marketing to strategic industrial buyers. International Academy of Management and Marketing.

From 1990 until 1993, he worked as a seminar leader for ECL/LMI, an instructor and department head at ECPI, and an adjunct faculty member of Averett College. During this time, he completed his course work and received his doctorate in the fall of 1993.

Tom holds membership in the Virginia Vocational Association, the American Vocational Association, and Delta Mu Delta National Honor Society. He is a member of the Virginia State Tech Prep Advisory Board. He continues to teach and serves as department head at ECPI.

Thomas Lachowicz

Thomas Lachowicz